

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 852. (No. 17, Vol. XVII.)

APRIL 23, 1925

Weekly, Price 6d.
Post free, 7d.

Flight

The Aircraft Engineer and Airships

Editorial Offices: 36, GREAT QUEEN STREET, KINGSWAY, W.C. 2.

Telegrams: Truditur, Westcent, London. Telephone: Gerrard 1828

Annual Subscription Rates, Post Free:

United Kingdom .. 30s. 4d. Abroad .. 33s. 0d.*

These rates are subject to any alteration found necessary under abnormal conditions and to increases in postage rates

* Foreign subscriptions must be remitted in British currency

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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

1925

- Apr. 24 Commander C. D. Burney, C.M.G., M.P., R.N.: "The Position of the Airship in Aerial Transport," before I.Ae.E.
- Apr. 30 Wilbur Wright Lecture, Rear-Admiral D. W. Taylor: "Some Aspects of the Comparison of Model and Full-Scale Tests," before R.Ae.S.
- May 7 Aero Golfing Soc. Spring Meeting, Worplesdon.
- May 8 Capt. W. H. Sayers, Hons. Member: "A Résumé of Achievements in Aviation during the Past Year," before I.Ae.E.
- May 20 Visit to the National Physical Laboratory, Teddington, by I.Ae.E.
- May 21 Aero Golfing Soc. Match, Cassiobury Park.
- May 28 R.A.F. Middle East Dinner.
- May 29 Aero Golfing Soc. Match, Oxhey.
- June Race Meeting at Hendon Aerodrome.
- June 6 Visit to Croydon Aerodrome, by I.Ae.E.
- June 7 Gordon Bennett Balloon Race, Brussels.
- June 25 Aero Golfing Soc. Match, Mid-Surrey.
- June 27 Royal Air Force Display, Hendon.
- July 3-4 King's Cup Race.
- July 26-Aug. 9 Vauville Light 'Plane and Glider Meeting.

EDITORIAL COMMENT.



GREAT BRITAIN has resumed airship work with a vengeance. There is no doubt at all about it. And our usual airship luck still seems to hold. No sooner have we got one of our old ships into the air again than she is put on the mast and as promptly torn away from it. However, the little adventure of

R. 33 the other night, alarming as it appeared at one time, and serious as undoubtedly it was, much more

R.33

so than is generally realised, is not altogether to be placed on the debit side of the ledger. In fact, quite the reverse. Of course nobody could wish the "skeleton" crew of 19 (and one first officer) such an experience, but if it had to come it was, perhaps, as well that it came when it did. The first news, that the airship had torn away with but six men on board, gave rise to grave anxiety, since obviously the airship could not have been handled by them, but when the correct statement came along it was felt that, provided the weather did not get worse, the crew might have a chance, a slim one possibly, but still a chance, to save the airship. And, as we now know, they did so very gallantly and very skilfully.

It would be early in the day yet to attempt to draw hasty conclusions from the R. 33 adventure. Not only might one make oneself ridiculous (as did the *Morning Post* by stating that the mishap showed that the Air Ministry does not know how to handle airships and that these can only be handled properly by the Navy!!), but to base opinions on what happened to an airship that was never from the beginning intended to be tethered to a mast might lead to quite erroneous conclusions. It should be realised that the R. 33 is at best a patched-up job, having had bits put in here and there and having had her nose strengthened for mast-mooring. At the moment it is not even quite clear that it was the airship hull structure which failed, and there are indications that the mast gear gave way first. In any case, the mast itself is as much of a makeshift affair as is the airship, and the root of the whole trouble is, if we come down to solid facts, that the

airship people have insufficient funds wherewith to carry out the work in hand, and have consequently had to do the best they could under the circumstances. The court of inquiry which is to examine the whole question will doubtless bring to light much that is at present obscure, and all that can be said with certainty at the moment is that the adventure has at any rate demonstrated that even a badly crippled airship need not necessarily end in a fatal or even serious accident, but can, with skilful handling, bring herself and human freight safely to port. The crew of R. 33 was relatively inexperienced, certainly as far as recent experience goes, and it is to their credit and to that of the young "skipper," Lieut. Booth, that Pulham was reached once more and the airship safely housed in her shed. The repairs will necessarily take some considerable time, and this fact will delay the process of obtaining the data sought before construction of the monster airship is commenced. In other respects, however, very valuable experience has undoubtedly been gained, which will in a large measure make up for any delay.

Stalled Flight

Last week's demonstration at Croydon, when Flight-Lieut. Bulman flew an Avro 504 K, fitted with slots, and Fokker flew one of his own large commercial monoplanes at speeds well below the normal stalling speed, did not, perhaps, show anything that was new or not known before, but it did at any rate call attention to one phase of flying which is of very great importance in service aviation no less than in civilian flying. At the same time it should be realised that solving the problem of control at angles above the stalling angle is but one of many subjects connected with the safety of flying.

Even if it is granted that ample control is available after an aeroplane has passed the stalling angle, there are still risks to be faced. The stalled aeroplane does not, as some people appear to imagine, "sit still" in the air. It is sinking vertically, although it may remain in a more or less horizontal attitude. The heavily loaded commercial machines of modern times would probably sink at far too high a rate to make a landing entirely safe, although we do think that to approach the ground in this manner would be preferable to approaching it in a vertical dive, and the great point in favour of the control-above-stalling-speed argument is that it does seem to give a pilot time to think and to correct his mistakes before it is too late.

It is fairly certain that a skilled pilot—and no other type of pilot need be considered in relation to commercial aviation—will never accidentally stall his machine unless he is preoccupied either through searching for a suitable landing-ground or for some other reason. The results of a stall are, however, likely to be much more serious if the machine stalls suddenly and requires a very long drop before coming under control than if it sinks slowly and under control.

Even if it is admitted, therefore, that control beyond the stall is not the complete solution, it does seem to be one very important step towards safety in flying, and we think the question should be very seriously considered whether the time has not come when all commercial machines should be expected to possess this quality.

No Lympne in 1925

The Official Notices of the Royal Aero Club published on p. 245 of this week's issue of FLIGHT are of considerable interest in so far as they give the first official indication that there is to be no light 'plane competition in Great Britain this year. The decision will not, perhaps, come as a great surprise, since it has been obvious for some time that we have taken too long to make up our mind what is really required, and that in consequence it would have been well-nigh impossible for engine manufacturers to produce new types in time—at any rate, if such types were to be thoroughly tested out before the actual competition. Although possibly inevitable, the decision is regrettable in many ways, not least because other countries are forging ahead and may well be found to be in a position to challenge the leadership held by this country in the light 'plane field. While we are talking and arguing other countries are working, and in this connection it is of interest to note that for the *Deutsche Rundflug*, which is to take place during the first week of June, no less than 86 machines have already been entered, many of them of the light 'plane class. That a country which is supposed to be vanquished, starved, tied hand and foot by restrictions in every direction, as Germany is, should be able to get together such a large number of machines is cause for congratulation as far as the German aircraft industry is concerned, but it is a rather sad reflection on ourselves, who, as the supposed victors, are barely able to scrape together half a dozen machines for competitions which have in the last few years mostly been without much interest to anybody.

Many months have elapsed since the last Lympne meeting, and the decision announced in the Aero Club notes this week cannot have been based upon any technical knowledge which was not available on the last day of the 1924 Lympne meeting. The long delay must, therefore, be attributed to lack of agreement, indecision, failure to make clear what we are really trying to evolve, and hazy thinking all around.

Even for the 1926 competitions for light 'plane two-seaters the fundamental basis of the trials does not appear to be above criticism, and it seems to us extremely doubtful whether that basis, one of limiting the engine weight to 170 lbs., is likely to produce either the type of engine or the class of machine required. As we have pointed out time after time and tried to hammer in, the one thing that really matters is cost. Now, placing a limit on engine weight is not the way to reduce cost; on the contrary, it is a direct encouragement to increasing the cost, since the aim of every engine designer will doubtless be, on this basis, to produce the greatest amount of power for the weight permitted. In point of fact, there is no reason to believe that the weight basis will be one whit better than the capacity basis, unless a number of other stipulations be made. Of any such there is at present no sign. To us it seems that it would have been very much better to have chosen as a basis the weight of the complete machine, with two on board and fuel sufficient for a flight of some stated mileage, competitors binding themselves to supply their machines in batches of 25 or 50 at some definite price, and marks being awarded on a rising scale for low price. In the meantime, it is satisfactory to note that such light 'plane clubs as desire to do so may make use of the de Havilland "Moth," and that some of them have already decided to do so. At least, they will be obtaining air practice for whatever may ultimately eventuate in the light 'plane class.

THE BOULTON AND PAUL "BUGLE"

Two Bristol "Jupiter" Engines

ALMOST from the very first, and certainly ever since they commenced to build machines to original designs, Boulton and Paul, Ltd., of Norwich, have specialised in high-performance twin-engined machines, a type which they have developed to a very high degree of perfection. First of the twin-engined machines to become generally known was the "Bourges," the first of which was, if we remember correctly, fitted with A.B.C. engines. One of these machines, it may be remembered, visited the Hendon aerodrome on the occasion of the welcome to the American transatlantic

development of which this firm must have spent very large sums of money. The result has, however, been that Boulton and Paul are now acknowledged to hold a leading position, not only in this country but probably in the world, in steel construction of aircraft. Mr. J. D. North, chief engineer and designer, his assistant Mr. Bennell, and a highly-skilled staff of specialists in various branches, have developed methods of rolling high-tensile steel strip into remarkably efficient sections, joined together by riveting, and not the least important progress made has been that connected

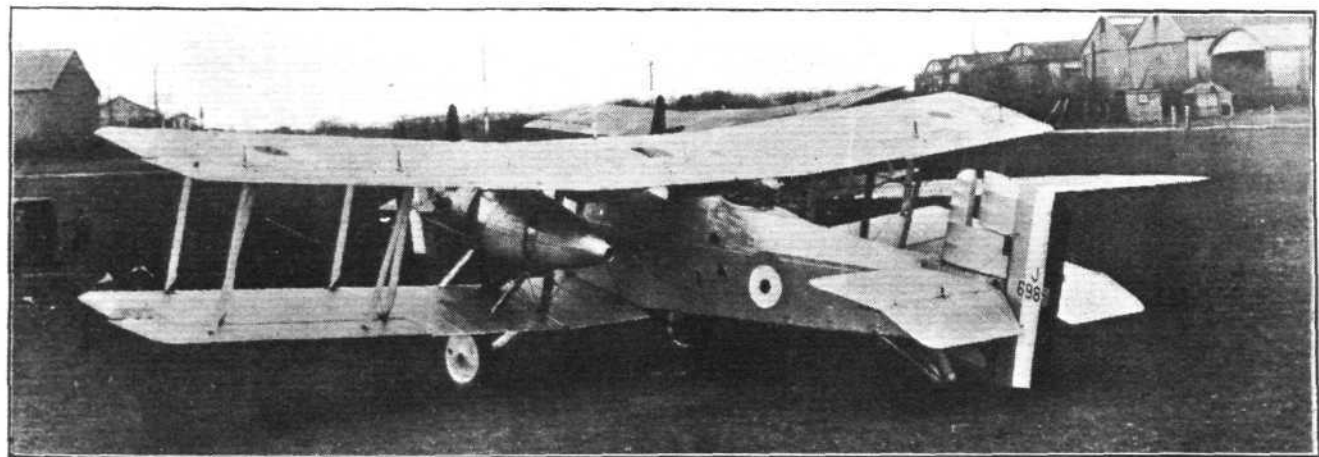


THE BOULTON AND PAUL "BUGLE" : Three-quarter front view. The engines are Bristol "Jupiters."

fliers, when Courtney's handling of it was the wonder of the day. Then followed a series of machines, among which descriptions and/or illustrations have appeared in *FLIGHT* of the "Bolton" with Napier "Lions," and the "Bodmin" with the same power plant, but with the engines placed in the fuselage, driving propellers on the wings through special gearing. Among the latest types of Boulton and Paul machines to which it is permissible to refer in detail is the "Bugle," with Bristol "Jupiter" engines. Even this is not the most recent type, but concerning its later develop-

with protecting the extremely thin steel strip against corrosion. There appears to be reason to believe that means have now been found which will prevent serious corrosion, and that therefore the special forms of construction which have been developed may be employed with confidence as regards the problem of corrosion.

On previous occasions detailed reference has been made to the special forms of metal construction developed by Boulton and Paul, and it is not, therefore, intended to repeat these here, but rather to devote such limited space as is



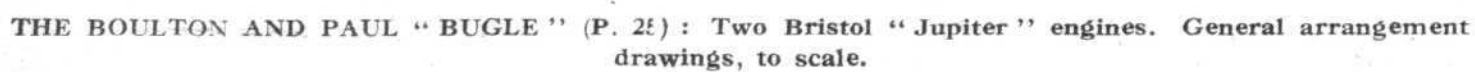
THE BOULTON AND PAUL "BUGLE" : Three-quarter rear view.

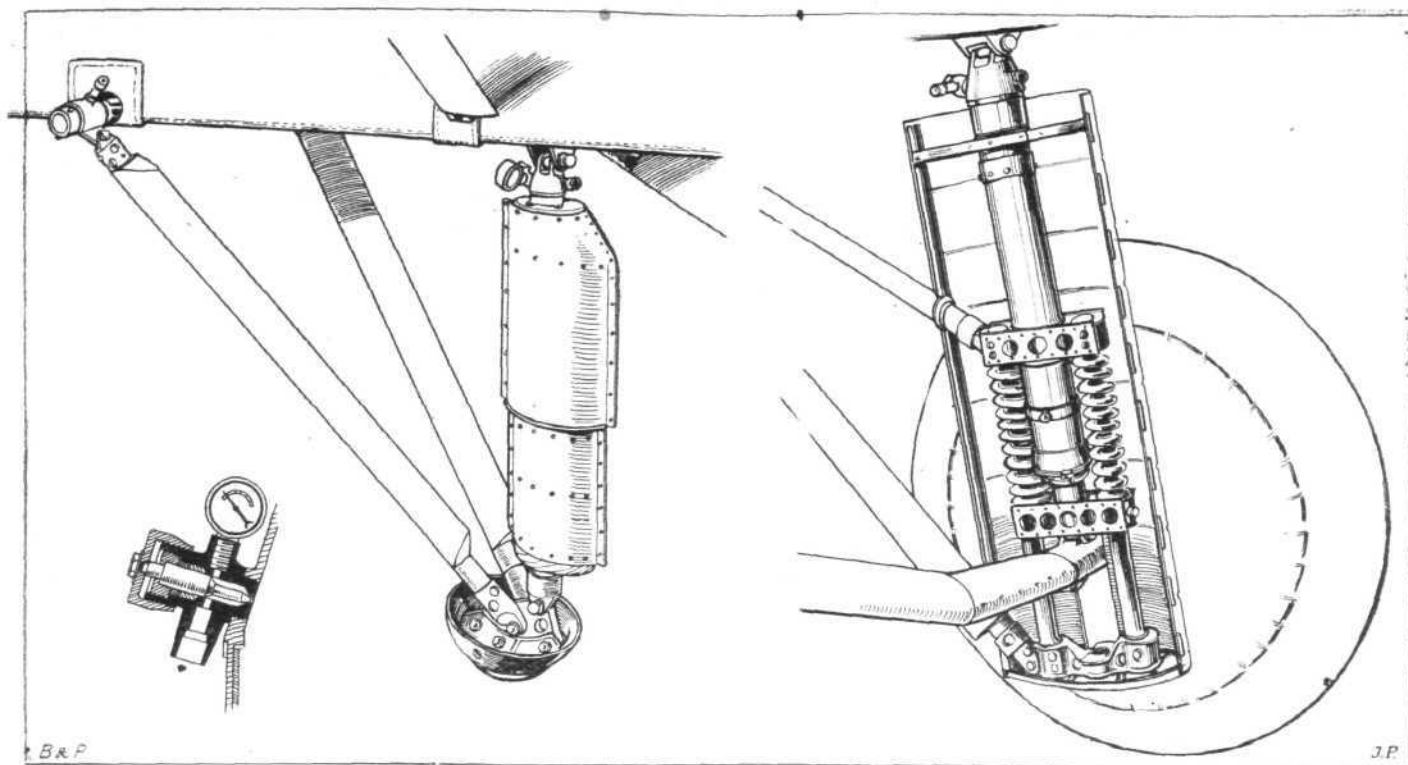
ments it is not possible to write owing to Air Ministry restrictions.

It will be recollected that it is now several years since Boulton and Paul disposed of all their woodworking machinery (as far as the aircraft section is concerned), and turned their attention to all-metal construction. The first "Bourges" were of usual wood construction, but shortly afterwards the works were converted for metal work solely, and the "Boltons," "Bodmins" and "Bugles" are all built entirely of metal, mainly steel, a form of construction upon the

available this week to the "Bugle" as a whole, and to such features as were not to be found in machines previously described.

The Boulton and Paul "Bugle" bears a very strong general family resemblance to the "Bourges" and subsequent types, although differing from them in many important respects. The machine is a twin-engined tractor biplane with the Bristol "Jupiter" engines mounted in the gap between the wings on tubular engine structures. As in most Boulton and Paul machines, the lower plane is of





THE BOULTON AND PAUL "BUGLE": The tail skid and one undercarriage leg. Both are of the oleo-pneumatic type. The small inset shows, in section, the arrangement of the air-pressure gauge which can be put in series or out by means of the needle valve. The gauge is, of course, in communication with the air in the leg during the process of pumping-up only, or when inspecting the pressure in the leg.

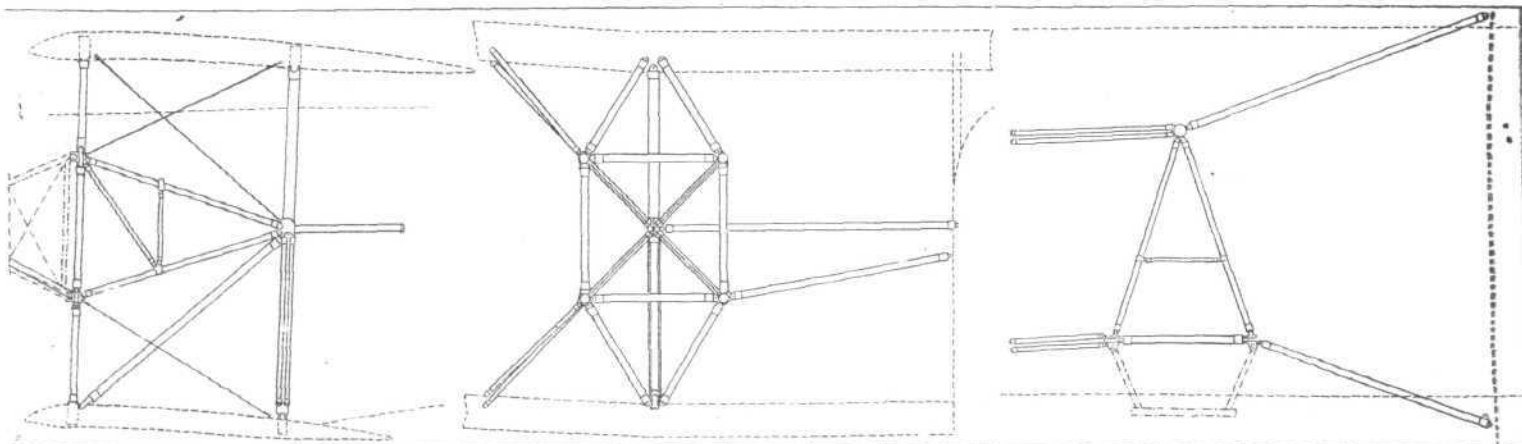
somewhat smaller chord than the upper, and the aspect ratio is relatively high, *i.e.*, in the neighbourhood of 8. The wings are of rectangular plan form with the corners rounded off. Ailerons are fitted to both upper and lower plane, and are balanced by projections working in cut-outs in the main wing tip. The balances are not symmetrical, but have a fairly flat bottom camber and a deeper top camber, the lower wing curve following the contour of the wing section (R.A.F. 15) when the aileron is in the neutral position.

The tail is of normal type, with trimming tail plane and unbalanced elevator. The rudder, however, has a very large balance, working in a cut-out in the fin. The area of the balance is a very large percentage of the rudder area, and would normally cause over-balancing. Since, however, the balance works in an area sheltered by the fin, it does not commence to work until well clear of the fin, and thus for ordinary turning the presence of the large balance does not upset the pilot's steering as it otherwise would. That the rudder and its balance is effective will be realised when it is pointed out that it is actually possible to switch one engine off and to fly not only straight, but actually turning towards the running engine, overcoming the turning moment. Locking devices are incorporated in the rudder operating gear, which enable the rudder to be set permanently over to one side or other while still retaining the movement of the rudder to a sufficient extent. As a matter of fact, a better description than locking device would be spring-

loading device, for, of course, the rudder is not definitely locked; what happens is that levers on each side set the rudder bar to any desired angle, according to the difference in thrust of the two engines, and springs incorporated in the gear enable a further movement to be made. Finally, there is, in the extreme nose of the fuselage, a small handwheel operated by the bombing officer, by which very fine adjustment of the rudder is made. This gear forms, as it were, a vernier adjustment of the rudder, and when operative works independently of the pilot. The question of form, size and disposition of the control surfaces of the "Bugle" have been very carefully gone into, with the result that the machine is stated to handle particularly nicely, and to fly very slowly while still being under perfect control.

While on the subject of controls, mention should be made of the fact that the ailerons are mounted in self-aligning ball bearings, so that a slight deflection of the wing spars does not cause them to work stiffly, and as a matter of fact, the ailerons, in spite of their large area, are remarkably easy on the controls and require surprisingly small effort on the part of the pilot, a fact of great importance during a long flight.

Constructionally, the "Bugle" is of fairly normal Boulton and Paul type. An exception is found in the attachments of the inter-plane struts which are now secured to plates straddling the spars. The spars are always in the plane of the wing bracing, and there is thus no offset torque moments. The struts themselves are of highly interesting construction,



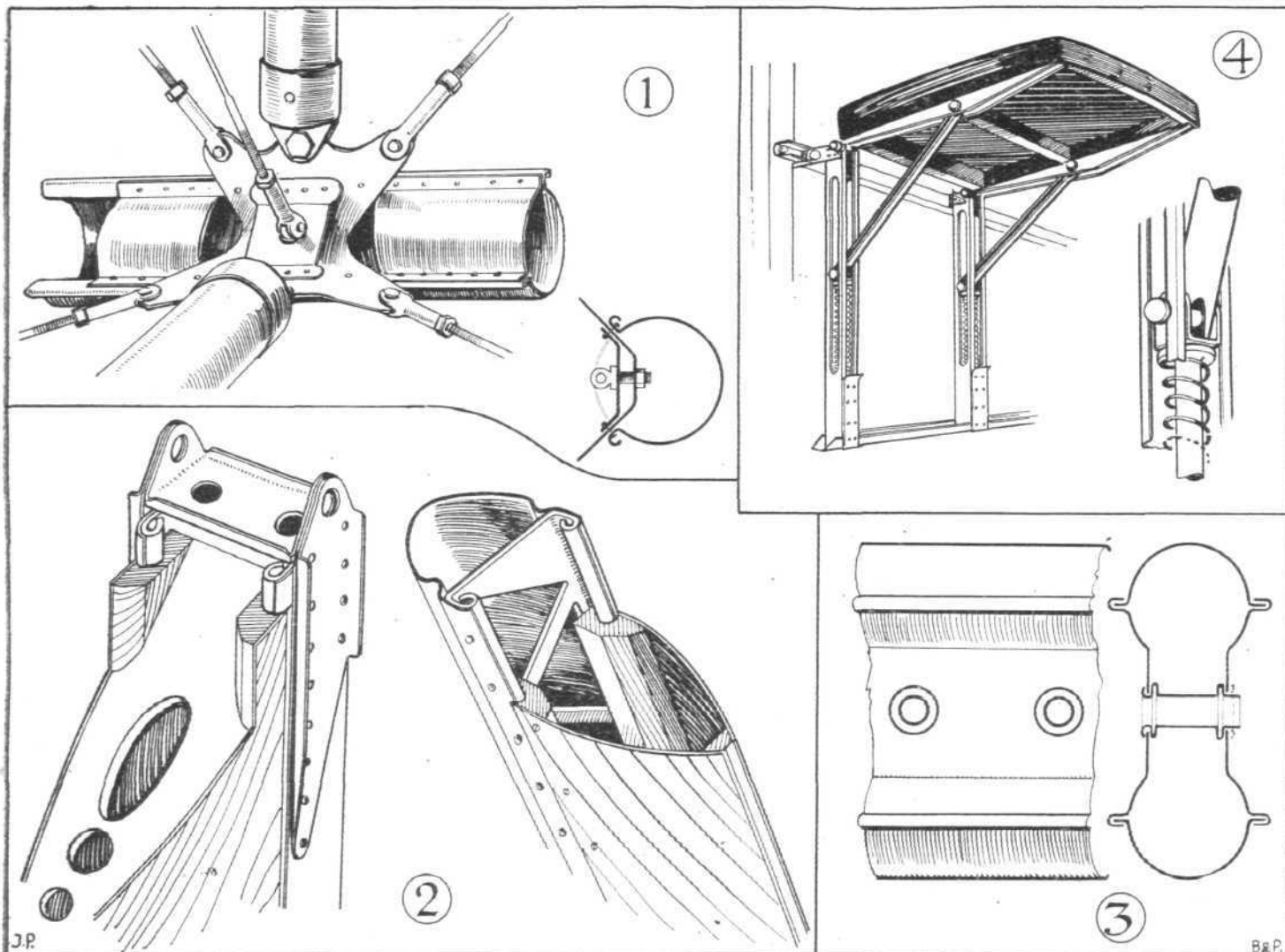
THE BOULTON AND PAUL "BUGLE": Side and front elevations and plan of tubular engine structure for mounting the Bristol "Jupiter" engines. The actual engine mountings in front are arranged to swivel so as to facilitate inspection of the back of the engines.

and are built either in steel or in Duralumin. The inner and more highly-stressed struts are of fairly heavy gauge steel. Less severely loaded struts are of thinner gauge steel, while the most lightly loaded struts are of Duralumin. Thus, with the same section a wide range of strut strengths is available. One of our sketches shows how the struts are built up, and is self-explanatory. The struts can be built of smaller width for the same strength as a tubular strut, or, conversely, for the same width and resistance will be stronger. The fairing is of three-ply wood, and is extremely light. It is slid over the projecting edges of the strut, so that after use the fairing can be slipped off and the strut examined if desired. We believe this strut construction is protected by a patent.

The Bristol "Jupiter" engines are mounted on tubular structures in the gap between the wings, and each engine is attached to the main engine structure by a swivelling mounting patented by Boulton and Paul several years ago. This

is a diaphragm bolted to the walls of the tube and having leak holes and a spring-loaded valve opening upwards. The tube is filled with oil up to just above the diaphragm, and air is pumped into the space above the oil to the required pressure. This, of course, is done with the leg fully extended. A neat air pressure gauge is fitted in the upper end of the tube, and has a needle valve arrangement for placing the gauge out of circuit when the undercarriage is in use. A jack is then placed under the undercarriage and the machine raised until the leg is extended. The pressure employed is, we believe, 60 lbs. per square inch, and when this pressure has been obtained, the needle valve is screwed down on its seating, and the gauge thus cut off from communication with the inside of the tube.

A somewhat similar telescopic leg is employed for the tail skid, and actually the machine can land and touch with the skid first without causing any damage, so that there does not



THE BOULTON AND PAUL "BUGLE" : 1, details of fuselage construction. 2, the construction of the special inter-plane struts, whose main structure is of metal, while the removable fairing is of three-ply wood. 3, a wing spar section, and, 4, a very light tip-up seat in the forward gunner's cockpit.

mounting facilitates access to the back of radial engines, and conical or tapered bolts are used so as to take up any wear that might take place. The engines and their supporting structures are enclosed in almost perfect streamline casings, as will be seen from the photographs. The fuel supply is by direct gravity feed, there being two petrol tanks, one for each engine, supported underneath the top plane. The tanks also are visible in the illustrations.

The oleo undercarriage fitted on the "Bugle" is of particularly robust construction, and has been designed to give exceptional shock-absorbing qualities. It has not been found possible to give a sectional drawing of one of the "legs," but a sketch shows the external appearance, and, with a few words of explanation, may serve to indicate the general principle.

The oleo-pneumatic leg consists, as usual, of two tubes, one of which telescopes inside the other. The lower tube in this case passes inside the upper, and carries at its upper end a piston with small leak holes, and also a spring-loaded valve opening downwards. The lower tube passes, of course, through a stuffing-box in the lower end of the upper tube. Inside the upper, larger-diameter tube, near its upper end,

appear to be much doubt about the shock-absorbing qualities of this form of oleo-pneumatic leg.

It is regretted that performance figures may not be published, otherwise it would, we think, be obvious that in the "Bugle" Mr. North has reached a very high performance for a machine designed to carry all sorts of "frightfulness," in addition to a crew of three and fuel for a very large cruising range. This is due, in some measure, to the all-metal construction, which enables a not inconsiderable saving in structure weight to be made, but also to careful aerodynamic design in so far as this is possible in a machine which must have all manner of excrescences dictated by military considerations. The wing section is the ubiquitous R.A.F. 15, but the aspect ratio is high, about 8, and careful streamlining has been carried out wherever possible, such as to undercarriage legs, tail skid telescopic leg, and, of course, to the engine housings. Incidentally, it may be of interest to mention that the Boulton and Paul aerodynamics staff has now commenced to calculate wing sections on the Joukowski-Prandtl theory, and have verified certain sections by wind tunnel tests. The agreement between calculated and experimentally-determined values has been found to be excellent.

CONTROL AT STALLING SPEED

Last Week's Demonstration at Croydon.

THE demonstration of stalled flight which took place at Croydon aerodrome on April 15, and of which a brief account was given in last week's issue of *FLIGHT*, was interfered with

we believe, experienced, but ultimately it was agreed that an Avro 504 K, which has been fitted at Farnborough with slotted leading edge working in conjunction with the ailerons,



Interested spectators watching controlled stalling flight at Croydon, the group including many prominent men in the aviation world.

to some extent by the strong wind. Not that this prevented the machines from carrying out all the manoeuvres planned, but the fact that the wind blew across the aerodrome at something like 40 m.p.h. prevented the spectators from forming a true idea of what the machines really were doing. This was demonstrated when the Farman "Goliath" went up after the "official" show and proceeded to crawl along at almost no ground speed, a feat which was rendered possible by the light wing loading of this machine, and by the strong wind into which the "Goliath" was flying. Apart from this, however, the demonstration was quite a success, and had attracted a goodly number of visitors, not only from the general public, but even more so from aviation circles. Many of our aircraft constructors and chief aeroplane designers were present, and there was a surprisingly large attendance of well-known test pilots, a fact which proves how great is the interest taken in the subject of control at stalling speed or below.

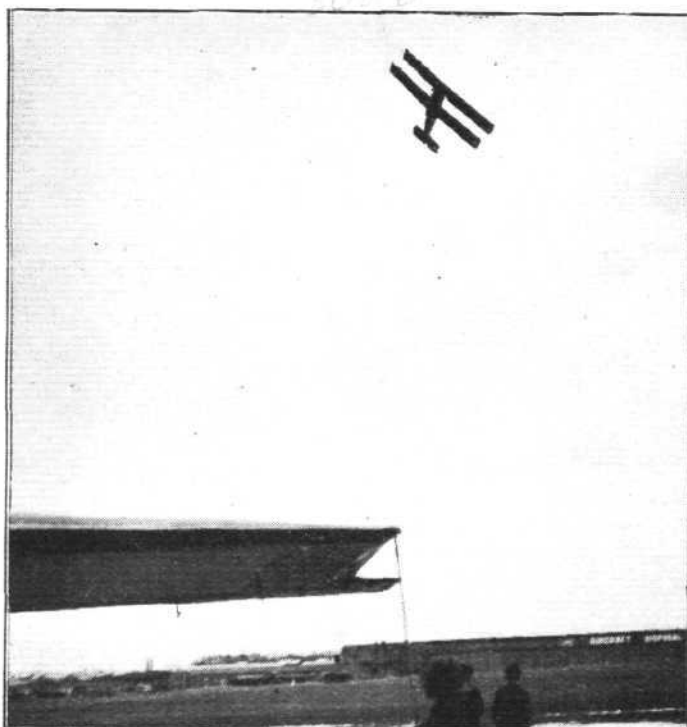
When it was first announced that Mijneer Fokker would give a demonstration of flying at stalling speed without losing control, representations were made to the Air Ministry to let one or more of the British machines pay a visit to Croydon on the same occasion so as to demonstrate that we in this country have machines which are capable of being kept under perfect control at angles well above the angle of maximum lift. At first some difficulty was,

should be permitted to give a demonstration, and Flight-Lieut. Bulman was chosen as the pilot.

When the visitors arrived at the aerodrome on Wednesday of last week there was, as already mentioned, a strong wind blowing across Plough Lane, and it became obvious that almost any machine would be able to "sit"

above the aerodrome without moving forward at any great speed. The Avro 504 K was standing in readiness outside one of the hangars, and the Fokker monoplane was brought around from the Beddington side. Both machines naturally came in for a considerable amount of interested examination by the technically minded, and it was found that whereas the Avro wing arrangement incorporated a fair amount of extra gear in the form of an auxiliary leading edge so coupled to the ailerons as to move in unison with them, the Fokker was entirely without any special mechanism. Not only so, but the control surfaces on the Fokker monoplane were, as regards the tail, of fairly small area, certainly not uncommonly large, while the ailerons themselves were distinctly small, although their horn balances were, perhaps, a shade larger than normal.

The first machine to go up was the Avro piloted by Bulman. The take-off was spectacular in the extreme, the high wind enabling the Avro to leap off the ground after a run of a few yards only, and the climb being extraordinary. By the time the machine had approached Plough Lane it was a couple



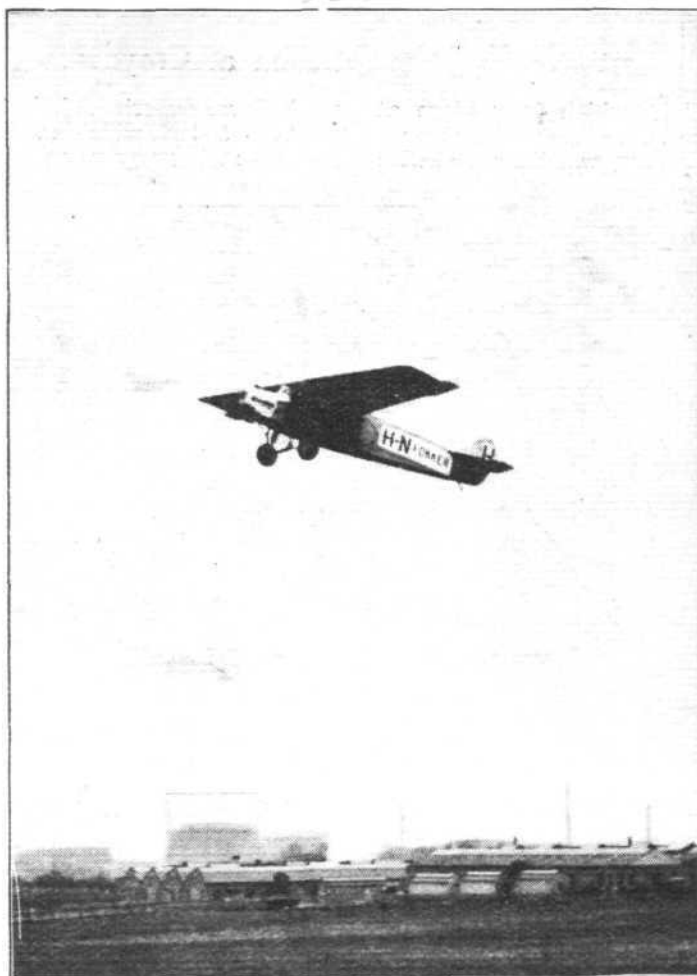
Flight-Lieut. Bulman on the slot-wing Avro doing a stalled turn without going into a spin. This performance is, of course, one which, in a "normal" machine would almost inevitably provoke a spin, but the Avro fitted with the slot-aileron combination showed no tendency to "autorotate." We understand that some time previously Flight-Lieut. Bulman put the machine into a stalled turn, and then stopped his engine "just to see what would happen." Nothing did happen, the machine remaining under perfect control.

of hundred feet up and was practically sitting still, with, as somebody put it, "its tail between its legs." A slight roll from side to side was noticeable, but the machine was obviously well under control. Turning down wind to get over the aerodrome again, Bulman circled and repeated the performance, this time letting the machine sink fairly rapidly, still with its tail well down.

On one occasion he turned down wind while on a stalled turn, a manoeuvre which would inevitably have produced a spin if carried out on the majority of "normal" machines. The performance would have been more easily followed if carried out farther towards the northern end of the aerodrome and nearer Plough Lane, but even as it was the nature of the turn could be followed by those who were on the look-out for it.

After Bulman had landed and received a well-merited applause, Mijnheer Fokker invited a number of press representatives to go up with him, among whom was the writer of the present notes. A representative of the Royal Aircraft Establishment at Farnborough got into the pilot's cockpit next to Fokker, and the writer had the good fortune to be allotted the forward seat on the starboard side of the saloon. As the door communicating with the cockpit was left open, he was able, as it subsequently proved, to observe Mijnheer Fokker throughout the flight, and was thus able to follow the various manoeuvres.

Taxying across the aerodrome and turning around to face



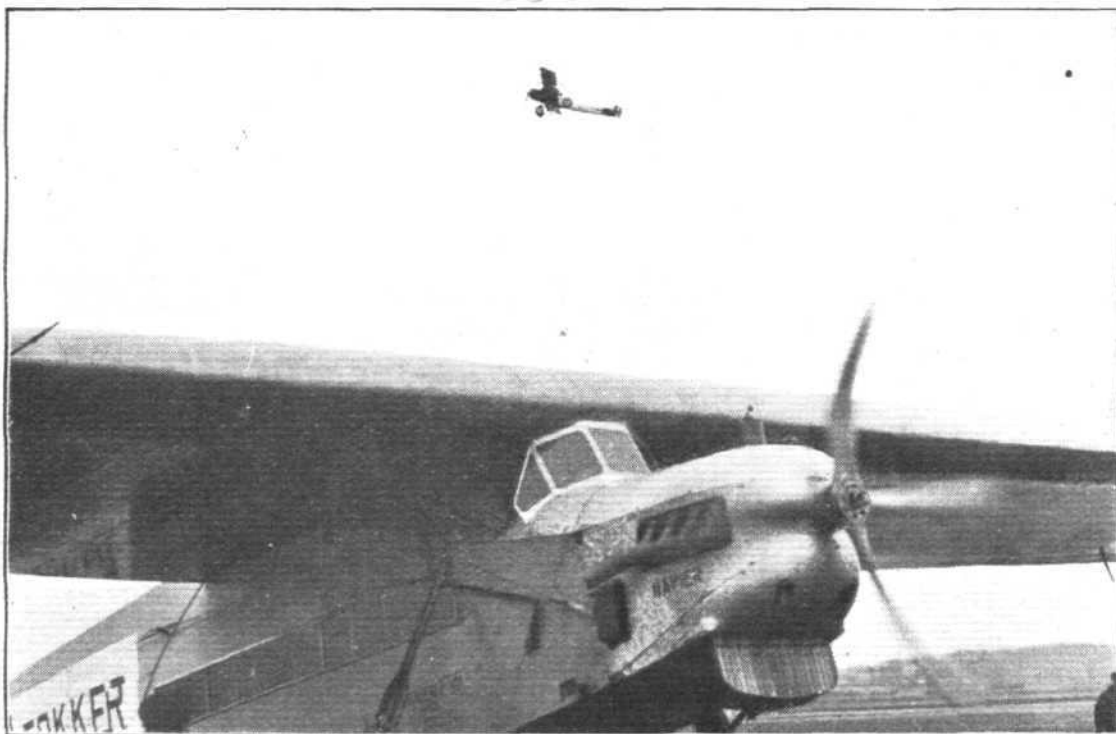
The Fokker F.VII, Napier "Lion," taking off for one of its demonstration flights.

the wind, the large monoplane got "unstuck" after a very short run, in spite of being loaded with ten occupants, and proceeded to climb at a steep angle. Arrived over Plough Lane, Fokker pulled the nose right up until the passengers were almost lying on their backs, and, having steadied the machine, the pilot let go of the controls (not the rudder, of course, but of the wheel).

The machine rolled very slightly from side to side, and sank very slowly, the nose gradually dropping all the while, until a normal attitude had been reached. This manoeuvre was carried out with the engine running, although not at full power. During the next twenty minutes Fokker demonstrated the machine's stability in this fashion time after time, including a short period of flying stalled with the engine off. A demonstration of lateral control was also given by Fokker giving full aileron to one side, leaving the machine to reach a steep bank, and then whirling the wheel over in the opposite direction, letting go when the ailerons were hard over and not taking control until the machine had righted itself. It was noticed that the machine was what would certainly be considered sluggish on the ailerons in a British machine, but although she

answered slowly she did undoubtedly answer at once. A little later Fokker did one or two stalls, just by way of showing that the machine *could* be stalled if desired. There can be no doubt, however, that he would have to be a very clumsy or careless pilot who could accidentally stall the machine while

Stalled flight:
Bulman on the
Avro, flying
stalled above the
Fokker mono-
plane.



The Fokker F.VII: Three-quarter front view. The engine is a Napier "Lion."

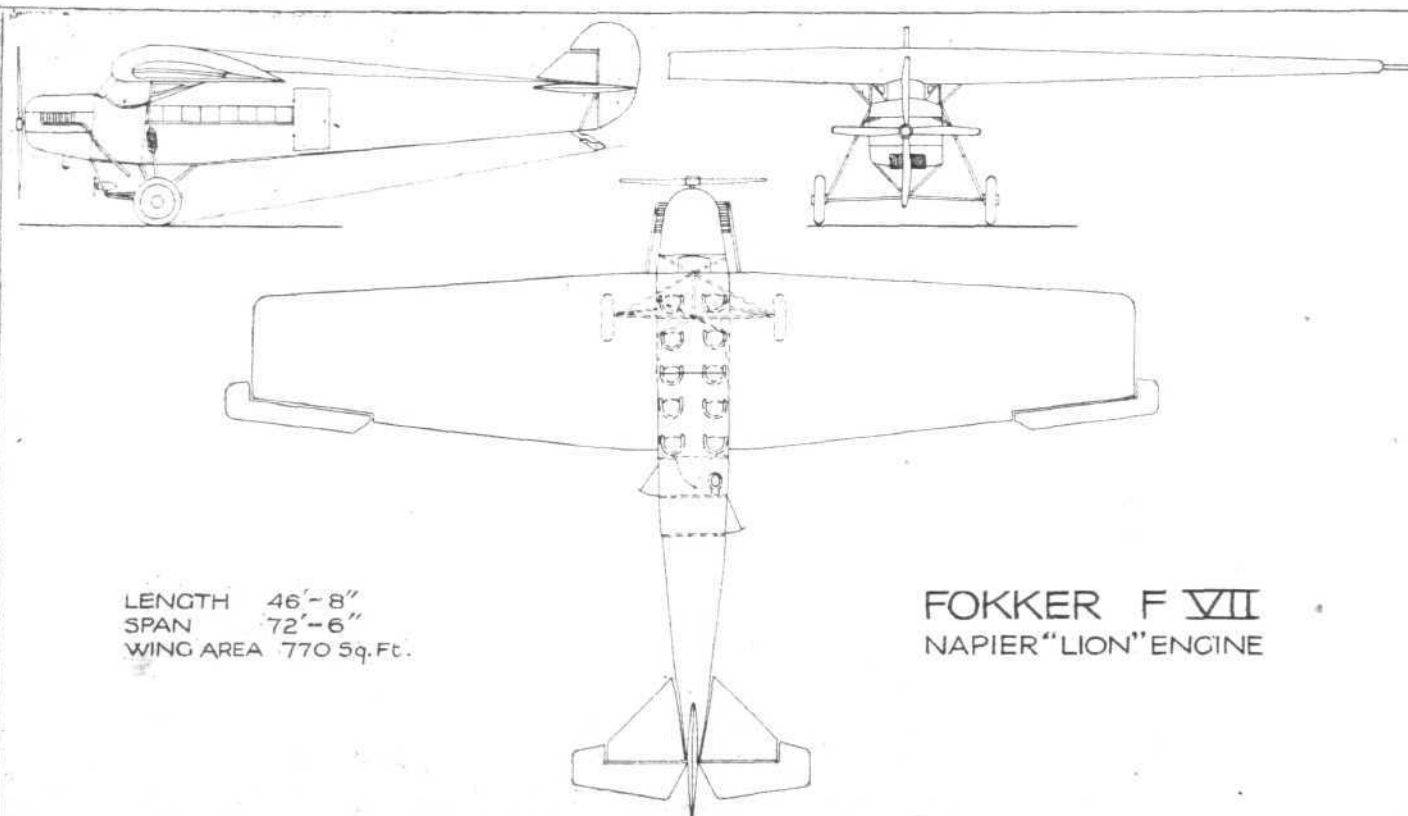


The Fokker F.VII: Three-quarter rear view.

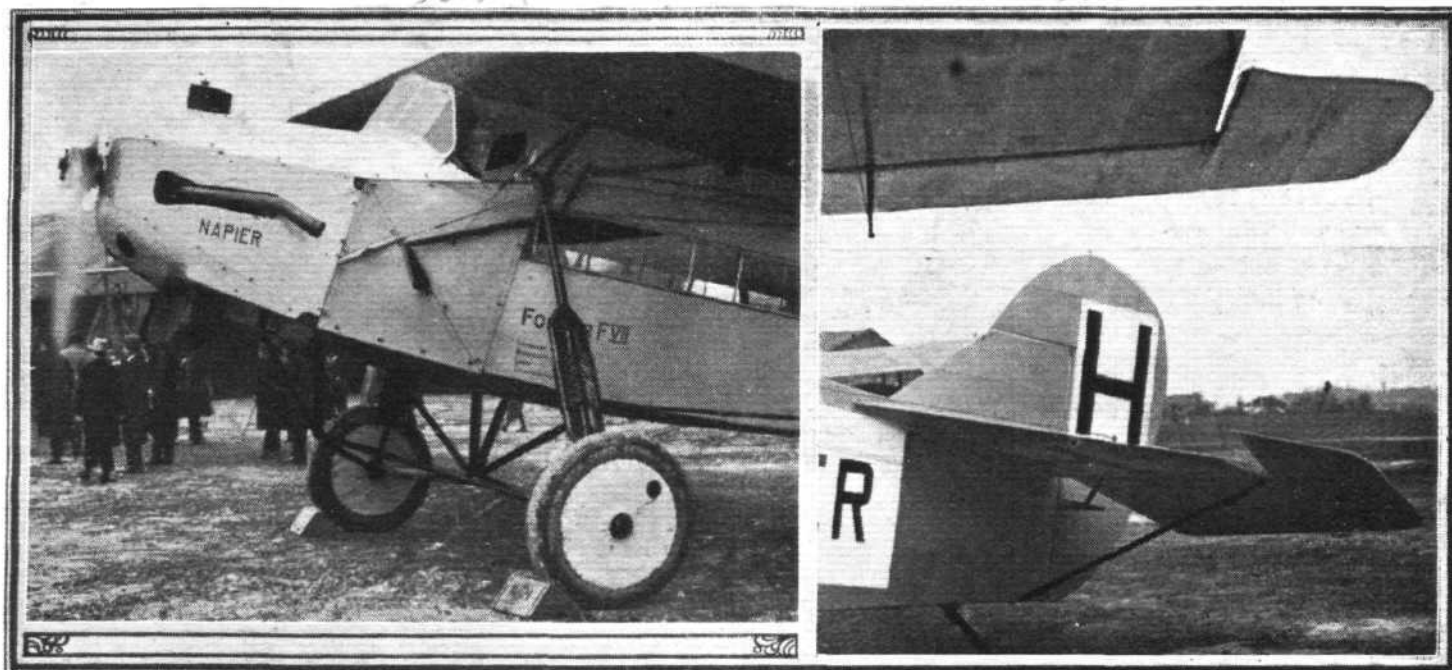
taking off (i.e., making a stalled climb) or while gliding around looking for an emergency ground for a forced landing, and to prove that and nothing more was, as we understood it, precisely the purpose of the demonstration. The Fokker monoplane had been described in the daily press as "crash proof," and other equally futile claims had been made for it, but as Fokker made clear later, when, climbing on to a packing case in one of the hangars, he delivered himself of a little speech, no aeroplane could possibly be crash proof, and all he claimed was that his monoplanes were not easily stalled accidentally.

Later in the afternoon Bulman and Fokker again made flights, but these were of precisely the same nature as the first flights. On the second occasion, however, Air Vice-Marshall Sir Sefton Brancker, our energetic and ubiquitous Director of Civil Aviation, occupied the seat in the cockpit next to Fokker's, and we believe that his experience will prove to have strengthened his determination to make British commercial aeroplanes as little liable to stall as is this Fokker monoplane.

With regard to the machines themselves, the Fokker monoplane used in the demonstration was a type F. VII,



The Fokker F.VII, with Napier "Lion" engine: General arrangement drawings.



The Fokker F.VII: On the left, the nose, showing neat cowling. The undercarriage is of special design, and gives a very wide track. On the right, the control surfaces, which are of perfectly normal shape and size. The horn balance of the aileron is not of symmetrical section, but has flat bottom camber.

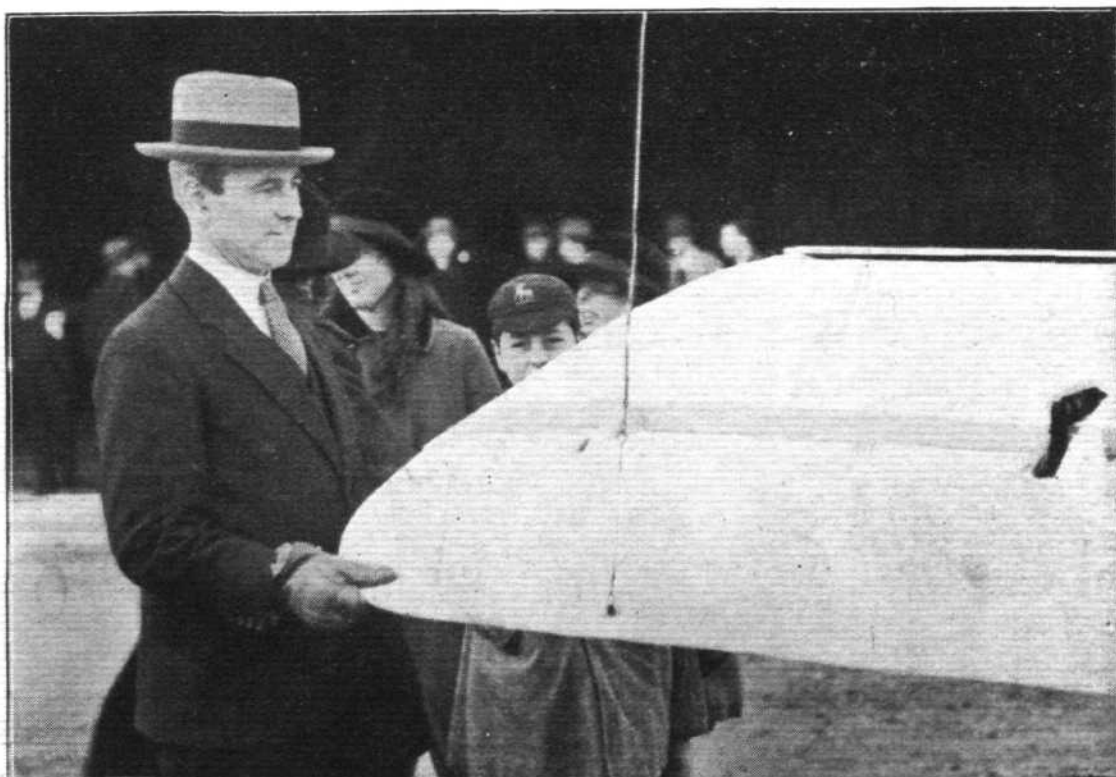
fitted with a Napier "Lion" engine. Similar in general appearance to the monoplanes used on the regular air routes, the F. VII is somewhat larger and with a higher performance. Its normal accommodation is for eight passengers in the saloon, the wicker chairs being ranged along each side. There is a door in the front wall of the saloon communicating with the pilot's cockpit, and aft of the saloon is a lavatory and a luggage compartment.

Constructionally the F. VII is similar to the F. III and F. IV in that the fuselage is a welded steel tube structure braced with piano wire in the typical Fokker manner, while the monoplane wing is built entirely of wood, the wing covering being in the form of three-ply. The ailerons are, as will be seen from the plan view of the general arrangement drawings, of very small area, although the horn balance is

a fairly large percentage, and the tail and rudder also are of quite normal proportions. It will be observed, however, that the fuselage is relatively long, so that the tail is working on a long leverage and probably largely out of the downwash. The wing section appears to be similar to some of those tested at Göttingen, although its exact number cannot be stated. There is an apparently flat-bottom camber, but with a raised leading edge, and in plan form as well as in thickness the wing tapers from centre to tip.

The undercarriage is of novel type, and provides a very wide track, a necessary precaution in a high-wing monoplane. The telescopic legs of the undercarriage are largely built up from tubing by welding, and would probably make some of our Air Ministry experts squirm. It has, at any rate, the advantage that shock absorbers can be readily replaced,

Slots and ailerons: Mr. A.V. Roe explains to his youngest son the action of the Handley Page slots on the Avro 504.





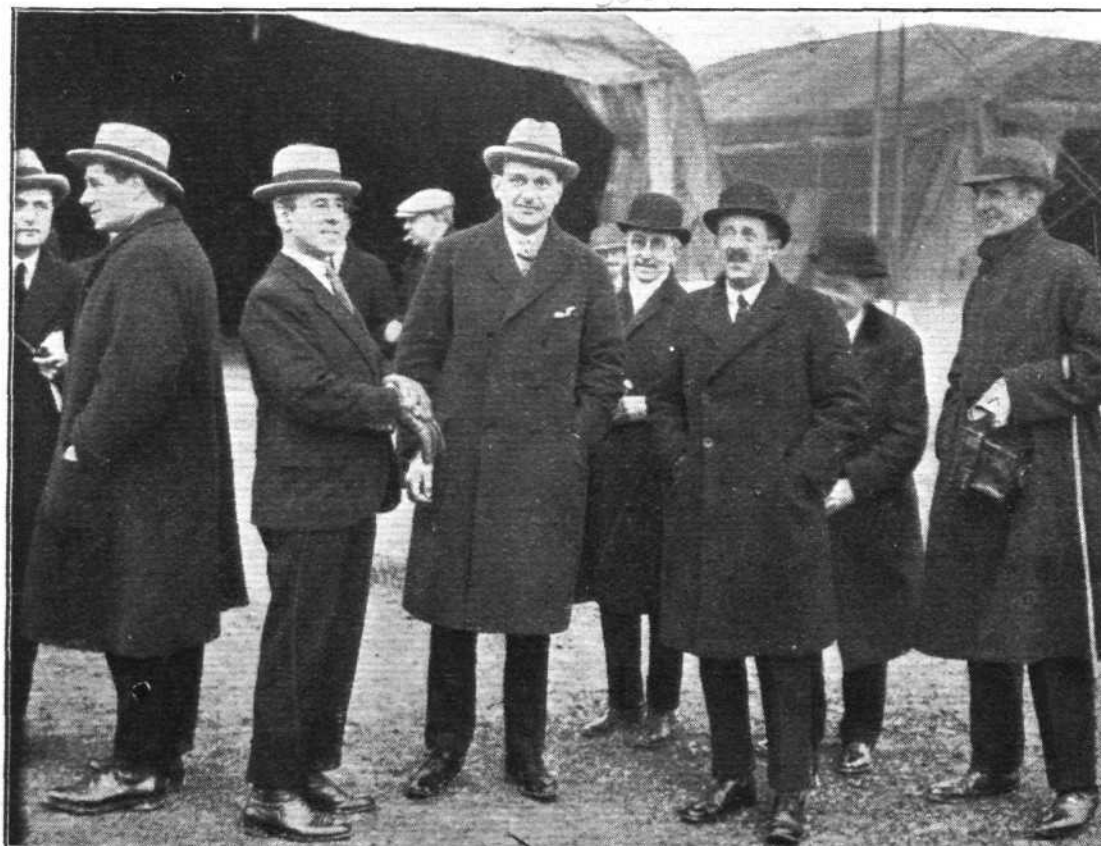
Mijnheer Fokker standing by his non-stalling monoplane.

and even more easily inspected, so that in commercial use any defect in individual rings can immediately be discovered. The principle of having the rubber exposed to light may not, however, be entirely a good point. The shock-absorbing qualities of this undercarriage appear to be very good, but one cannot help thinking what a perfect oleo-pneumatic type could be arranged to take its place, the arrangement lending itself admirably to the use of this type. However, there is no doubt that such an undercarriage would be a great deal more expensive, and it is probably for this reason mainly that Fokker has chosen to retain the plain rubber type.



Fraternalising with the "enemy": Mr. H. T. Vane appears to be pleased with the behaviour of the Napier "Lion" in the Fokker monoplane, but Mr. Lappin, of Rolls-Royce fame, has seen other Fokkers that he likes better.

Concerning the reasons which cause the Fokker F. VII to stall so gently, and to remain under control up to very large angles, the small ailerons and the general absence of any special devices suggests that in a large measure this must be due to the wing section employed. We have seen no figures relating to this particular section, but it appears evident from the behaviour of the machine that the lift curve, plotted on angle of incidence, must be very flat at the top, and drop off gently after passing the angle of maximum



Among the visitors to Croydon last week were Mr. A. V. Roe, Mr. Handley Page, and Air Vice-Marshal Sir Sefton Brancker.

ft. The shape of the section, in so far as it can be judged by inspecting a complete wing, does not seem to promise such a shape of lift curve, but possibly the complete wing may have a different lift curve from that of the central section, for instance, the tapering of the wing towards the tips, and the consequent change in profiles possibly having the effect of causing the central portion to stall before the tips. The ailerons, as already mentioned, are of very small area, and their effect, although immediate, is not rapid. The horn balances, it was noticed, are not symmetrical, but have a flat bottom camber, and they are presumably rigged at a slight negative angle of incidence, as it was noticed that in straight flight both horn balances could be seen projecting slightly below the wing tip ribs. It is of interest to note that the wing loading of the Fokker is 10.6 lbs./sq. ft., a fairly high figure even assuming that the wing section is of the type known as "high-lift."

Whatever the aerodynamic reasons for the absence of tendency to stall violently and accidentally, there can, we think, be no gainsaying the fact that the Fokker F. VII is particularly "docile" round about stalling speed, and as Mijneer Fokker pointed out in his little speech, the lines operating with Fokker monoplanes have been singularly free from serious accidents, so that, again quoting Fokker, "the proof of the pudding is in the eating."

Following are the main particulars of the Fokker F. VII as fitted with Napier "Lion" engine: Length, o.a., 31 ft. 5 ins.; span, 72 ft. 6 ins.; height, 9 ft. 6 ins.; total wing area, 770 sq. ft.; weight of machine empty, 4,960 lbs.; crew, 350 lbs.; fuel and oil, 1,190 lbs.; passengers and luggage, 1,650 lbs.; total loaded weight, 8,150 lbs.; wing loading, 10.6 lbs./sq. ft.; power loading, 18.1 lbs./h.p. For some reason the performance with full load is not available, but with a total weight of 7,950 lbs. the climb to 3,300 ft. occupies 6 mins. 8 secs.; to 6,600 ft. in 16 mins. 3 secs.; and to 9,900 ft. in 33 mins. The absolute ceiling is 13,100 ft. and the service ceiling is 11,500 ft. The rate of climb at ground level is 9.2 ft./sec. (552 ft./min.). The top speed is stated to be 107 m.p.h., the cruising speed 93 m.p.h., and the landing speed 47 m.p.h. The cruising range is 4½ hours at full throttle.

The Avro 504K does not itself require any introduction to readers of FLIGHT, except to say that it is, apparently, in spite of being a 12-years-old design, the type nearly always used for experimental purposes. The machine has been fitted with almost every conceivable engine (except the Napier "Cub"!), and with large wings and small wings, large rudders and small rudders, flaps, slots, and every conceivable "gadget," and yet it seems that whatever one does one cannot spoil the famous 504. In this case, the Avro had been fitted, at the R.A.E., with a combination of slots and ailerons evolved at

that establishment. The arrangement is such that the auxiliary plane, of the Handley Page type, does not extend the whole length of the wings, i.e., the slot is not used as a means of lowering the stalling speed, but is of the same length as the aileron and is coupled thereto by a system of cranks and levers in such a manner that when the aileron is in the neutral position the slot is closed. When the aileron moves down the slot is opened, but when the opposite aileron moves up its slot remains closed. What happens is apparently that at large angles of incidence, such as during a stall, the function of the ailerons is taken over by the slots, the opening of the latter giving extra lift under conditions when the ailerons would probably be inoperative. In normal flight, when the ailerons are moved to a very small extent only, the difference in lift between slot open and slot closed conditions is relatively small, and so the presence of the slots does not interfere with the normal aileron control, since, presumably, the slot does not have any great effect when only opened a very little. It is obvious that by suitable gearing of slot, or rather of auxiliary plane, to aileron the former can be kept closed until the latter has reached any desired position.

The combination of Handley Page leading edge slot with normal ailerons is not only capable of giving extra lift when plain ailerons would mostly fail, but at large angles of incidence the negative yawing moment is, apparently, reduced to a very small figure. Mr. Handley Page showed us a series of curves obtained with this combination, in which yawing moment was plotted on a base of rolling moment. At very large angles of incidence the yawing moment for a large rolling moment was very small indeed, in fact, so small as to be easily taken care of by a rudder of normal proportions. To retain ample lateral control of machines fitted with the slot-aileron combination it is not, therefore, necessary to fit a specially large rudder.

Flight-Lieut. Bulman's demonstration was certainly sufficiently convincing to warrant the adoption of the slot-aileron combination on large and heavy commercial machines, since, even if it is admitted that control above stalling angle is not the whole problem, it does, at any rate, provide one more safeguard against serious accidents. It must, of course, be admitted that so long as we use machines with a wing loading of 10 lbs./sq. ft. on high-efficiency, low-lift wing sections, a stall is likely to be sudden and the machine liable to drop a considerable distance before coming under control, and also that, if control were possible under these conditions, the vertical rate of descent would be too high for the energy to be absorbed by any practicable undercarriage. Personally, however, we are quite certain that most would prefer to approach the ground at 30 or 40 m.p.h. vertical speed, with the machine horizontal, to approaching it with the machine diving vertically at 150 m.p.h.

PROGRESS OF CIVIL AVIATION IN GERMANY

GERMANY, in spite of the restrictions as regards the construction of aircraft laid down by the Allies, appears to be making big strides in the matter of civil aviation. Judging from recent reports in various German journals, her air services during the present year will be extended to a considerable extent. In all parts of Germany local governments and municipal authorities are taking an active interest in the formation of local air transport companies, aerodromes, etc., while financial backing for the various schemes, linking up local companies with each other and with the big air transport companies such as the German Aero Lloyd, Junkers, etc., is not lacking. For instance, the Government of Baden has granted 200,000 mk. in the 1925 State Budget for the development of aviation in Baden.

The following air routes will, it is reported, be in operation this year:—(1) Berlin-Hanover-Amsterdam-London (German Aero Lloyd, in conjunction with Imperial Airways). (2) Berlin-Königsberg-Kovno-Moscow (Deutsche-Russische Luftverkehrs). (3) Berlin-Copenhagen (Aero Lloyd in conjunction with Danske Luftfartsselskab). (4) Berlin-Munich-Innsbruck (South German Aero Lloyd). (5) Hamburg-Bremen-Dortmund-Frankfurt-Mannheim-Stuttgart-Zurich (Württemberg Luftverkehr and Badisch-Pfälzische Luftverkehrs). (6) Bremen-Hanover-Leipzig-Chemnitz-Prague (Mid-German

Aero Lloyd). (7) Berlin-Dresden-Prague-Vienna (Sächsische Luftverkehrs). (8) Berlin-Malmö-Copenhagen-Gothenburg-Oslo (Junkers in conjunction with Scandinavian companies). (9) Berlin-Königsberg-Memel-Riga-Revel-Helsingfors-Leningrad (Junkers-Nord-Europa Union). (10) Berlin-Leipzig-Munich-Zurich-Geneva (Junkers Trans-Europa Union). (11) Frankfurt-Fürth-Nuremberg-Munich (Junkers-Trans-Europa Union). (12) Munich-Vienna-Budapest (Junkers-Trans-Europa Union). (13) Berlin-Hanover-Ruhr (Luftverkehrs Ges. Ruhrgebiet). (14) Frankfurt-Karlsruhe-Zurich (Badisch Luftverkehrs). (15) Berlin-Breslau-Gleiwitz (Schleisischen Luftverkehrs). (16) Berlin-Stockholm (night service, Junkers).

Of these services about half are new ones (Nos. 4, 5, 6, 7, 13, 14, 15 and 16), while some of the others, which have been in operation previously, have been extended or altered. As regards the operating companies, the following have been newly formed:—Badisch Luftverkehrs G.m.b.h., capital 350,000 mk.; Luftverkehrs Gesellschaft Ruhrgebiet A.G., capital 2,050,000 mks.; Schleisischen Luftverkehrs A.G., capital, 400,000 mks.; Oberschleische Luftverkehrs A.G. All these companies belong to the Junkers group. The following are in the Aero Lloyd group:—Badische-Pfälzische Luftverkehrs A.G., capital 500,000 mks.; Süddeutsche Aero Lloyd A.G., capital 600,000 mks.

Kenya-Khartum Air Service

FURTHER to the paragraph appearing in FLIGHT for April 16 on the above subject, it is reported from Nairobi that the Legislature has agreed to contribute £2,000 towards the

service. The proposal, previously referred to, of the Blackburn Aeroplane Company, of Leeds, is being submitted to the Air Ministry for technical advice. It is believed that the Belgian Government has agreed to participate in the scheme.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

COMMITTEE MEETING

A MEETING of the Committee was held on Wednesday, April 8, 1925, when there were present:—Lieut.-Col. F. K. McClean, A.F.C., in the Chair; Air Vice-Marshal Sir W. S. Brancker, K.C.B., A.F.C.; Mr. Ernest C. Bucknall; Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.; Wing-Commander T. O'B. Hubbard, M.C., A.F.C.; Lieut.-Col. M. O'Gorman, C.B.; Mr. F. Handley Page, C.B.E.; Major S. V. Sippe, D.S.O., and the Secretary.

Election of Members.—The following new members were elected:—

Reginald Charles Remes.
Geoffrey Haslewood Cooke.
Harry Bligh.
Alec Raymond Farrow.
Pilot Officer John Gerald Franks.
Flight-Lieut. William Harry Ellison.
Flying Officer Edward Beresford Forster.
Roland Edmund Dangerfield.
Wing-Commander Alexander Charles Winter.
John Fishwick Leeming.
James Ramage Addams.

Schneider Cup.—The following entries were reported:—
Gloucestershire Aircraft Co., Ltd.
Supermarine Aviation Works, Ltd.

The Secretary reported that he had cabled two entries to the National Aeronautic Association, Washington, U.S.A., and that an acknowledgment had been received.

Gordon Bennett Balloon Race.—The following entries were reported:—1. Lieut.-Col. John D. Dunville, C.B.E. 2. Mr. Ernest Allen. 3. Mr. Ernest Allen.

SUB-COMMITTEES

The following sub-committees were elected for the year 1925:—

House.—Ernest C. Bucknall, Major Herbert J. Corin, F. P. Dickson, D. C. MacLachlan, J. Stewart Mallam, Capt. L. V. Parkes, Major S. V. Sippe, D.S.O.

Finance.—Ernest C. Bucknall, Lieut.-Col. M. O. Darby, O.B.E., J. Stewart Mallam, F. Handley Page, C.B.E.

Flying Services Fund.—Lieut.-Col. Alan Dore, D.S.O., Chester Fox, D. C. MacLachlan, Wing-Com. T. O'B. Hubbard, M.C., A.F.C.

Racing.—Air Vice-Marshal Sir W. S. Brancker, K.C.B., A.F.C., Lieut.-Col. W. A. Bristow, A. S. Butler, Capt. R. J. Goodman Crouch, Lieut.-Col. M. O. Darby, O.B.E., Lord Edward A. Grosvenor, Group-Capt. C. F. Kilner, D.S.O., A.D.C., Lieut.-Col. A. Ogilvie, C.B.E., Sir Guy Standing, K.B.E., Howard T. Wright, Capt. C. B. Wilson.

Technical.—Major T. M. Barlow, Eng.-Com. W. Briggs, R.N., Major J. S. Buchanan, O.B.E., Lieut.-Col. C. B. Heald, C.B.E., W. O. Manning, Major R. H. Mayo, Lieut.-Col. M. O'Gorman, C.B., Lieut.-Col. H. W. S. Outram, C.B.E. Squad-Leader M. E. A. Wright, A.F.C., R.A.F.

Joint Standing.—Lieut.-Col. F. K. McClean, A.F.C., Air Vice-Marshal Sir W. S. Brancker, K.C.B., A.F.C., Lieut.-Col. M. O. Darby, O.B.E., Lieut.-Col. A. Ogilvie, C.B.E., Capt. C. B. Wilson.

Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., Lieut.-Col. F. K. McClean, A.F.C. Ex-officio Members of all Sub-Committees.

Stewards.—The following stewards were elected for the year 1925: Brig.-Gen. The Duke of Atholl, K.T., G.C.V.O., C.B., D.S.O.; The Rt. Hon. Lord Hugh Cecil; The Earl of Halsbury; Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.; Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P.; Admiral of the Fleet, The Rt. Hon. Sir Edward Seymour, K.C.B., O.M.

Light Aeroplane Competitions.—The Secretary made a report on the meeting at the Air Ministry on March 31, 1925.

This meeting was attended by representatives of the Air Ministry, the Society of British Aircraft Constructors, the Royal Aero Club, and the principal engine manufacturers.

Having fully considered the engine question, it was decided

to recommend that the competition for two-seater light aeroplanes with engines limited to a weight of 170 lbs. be held in August, 1926. It was reported that a very substantial prize would be forthcoming.

Aviators' Certificates.—The following aviators' certificates were granted:—

*7966. Flying Officer Russell Wykeham Morgan Hall. January 4, 1925.

7967. Charles John Graham. March 26, 1925.

* Granted on Royal Air Force Graduation Certificate.

LIGHT AEROPLANE CLUBS

A MEETING of the Light Aeroplane Clubs was held at the Royal Aero Club on Thursday, April 16, 1925, to consider the equipment to be provided out of the financial grants from the Air Ministry. It was reported that the Air Ministry had suggested that the Royal Aero Club should be the agents for the purchasing of the aircraft.

The Air Ministry having agreed to the De Havilland "Moth" type with Cirrus engine being approved for the clubs, the following equipment was decided upon:—

Lancashire Aero Club.—Two "Moths" and one spare Cirrus engine.

Newcastle Aero Club.—Two "Moths" and one spare Cirrus engine.

Light Aeroplane Section (Royal Aero Club).—Two "Moths" and one spare Cirrus engine.

The requirements of the Midland and Yorkshire Aero Clubs were to be notified later.

The question of insurance was discussed and deferred to a further meeting.

The following representatives were present:—Lieut.-Comdr. H. E. Perrin (Light Aeroplane Section, Royal Aero Club), Maj. G. Dennison (Midland Aero Club), Mr. John Bell (Newcastle Aero Club).

The Lancashire Aero Club were not able to attend, but their recommendations were put forward in a letter.

The orders for machines will be placed at once, and deliveries may be expected early in June.

RACING FUND

List of Donations for 1925.—Sir Charles Wakefield, Bart., £500; A. S. Butler, £100; Maharajah of Jaipur, £100; Lieut.-Col. A. Ogilvie, C.B.E., £25; J. H. Spottiswoode, £12 12s.; Sir Basil Zaharoff, G.B.E., G.C.B., £10 10s.; Capt. C. B. Wilson, £5 5s.; A. R. Dresser, £1 1s.; Geoffrey Dorman, £1 1s.

LIGHT AEROPLANE COMPETITION, 1926

A JOINT MEETING was held at the Royal Aero Club on Tuesday, April 7, 1925, at 5 p.m.

Present:—

Royal Aero Club.—Air Vice-Marshal Sir W. S. Brancker, K.C.B., Lieut.-Col. W. A. Bristow.

Society of British Aircraft Constructors.—Mr. T. O. M. Sopwith, Mr. H. T. Vane, Capt. H. E. P. D. Acland, Sir Henry White-Smith, C.B.E.

Air Ministry.—Maj. J. S. Buchanan, O.B.E., Lieut.-Col. L. F. R. Fell, D.S.O., O.B.E.

In attendance:—J. T. Brown, Assistant Secretary S.B.A.C., H. E. Perrin, Secretary R.Ae.C.

A discussion took place as to the conditions to be imposed for the Light Aeroplane Competition to be held in August, 1926. It was agreed that the weight of the engine should not exceed 170 lbs. The aeroplane and engine must be of British manufacture, and the entrant and pilots must be British subjects. The competition will consist of a flight over a course of approximately 1,000 miles divided into stages. Further details were left for discussion at the next meeting.

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.
H. E. PERRIN, Secretary.

R.33's NIGHT OUT

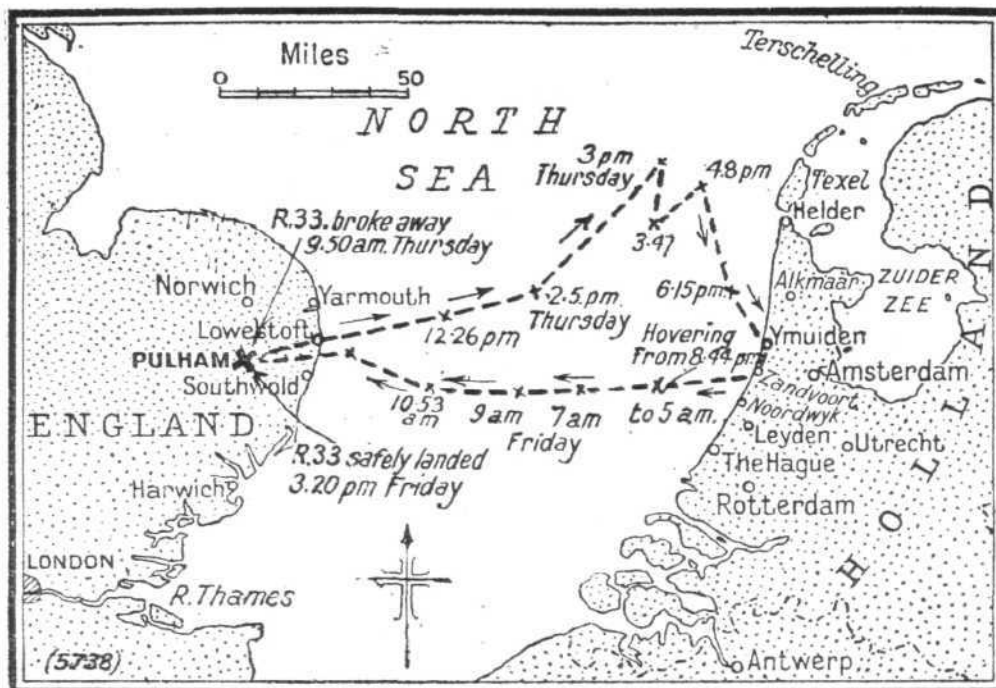
BRITAIN's one and only airship, the R.33, following the example of her American cousin "Shenandoah," has had a night out—without even "by your leave." During the severe gale which raged throughout April 16 the R.33 was torn away from the mast to which she was moored at Pulham, Norfolk, and in a damaged condition, with only a part of her crew on board, was driven rapidly out over the North Sea. In spite of the worst possible conditions, however, she—thanks to the splendid efforts of those on board, with Flight-Lieut. Booth in charge—she managed slowly but surely to overcome her difficulties and fight her way back safely to Pulham, after an absence, full of anxiety for all concerned, of 30 hours.

In many respects this "adventure" is very similar to that which occurred to the American rigid airship "Shenandoah" some time back, but in the case of the R.33 it would appear that the damage caused by the break-away was far more serious, so that the effort of navigating the airship safely back to port was a feat of airmanship of which we may well be proud.

Perhaps the most important fact in connection with the whole affair, however, is that while, for the second time, the elements have endeavoured to bring disaster—and what has been held by many to be certain disaster—to the progress of airships, this type of craft has again proved itself to be the victor. In fact, the airship has shown the world that it is by no means the helpless, impracticable proposition that some would have us believe it is.

There is one other feature of the R.33's exploit. During the 30 hours' fight with the elements, the R.33 continued the good work which has been the reason for her new lease of life—

viz., to test in actual flight certain vital calculations in regard to aerodynamical stresses on airships, etc.—and has been able to furnish the Air Ministry with some valuable information, which would have been impossible to obtain under normal conditions! As Maj. Scott said: "It is an ill wind that blows no one any good."



R.33's ADVENTUROUS VOYAGE: Sketch-map of the route taken by the airship. Published by courtesy of *The Times*.

The R.33 broke away from the mast at 9.50 a.m. on Thursday, having up to that moment ridden the storm well, and a crew of 20 had just taken over. The latter, in addition to Flight-Lieut. R. S. Booth, First Officer, included Flight-Sergt. G. W. Hunt, R.A.F., and the following civilian members of the



HOME AGAIN: R.33, with her nose crushed in, being held down by a ground party.

[Photo "Daily Mirror" Illustrations Bureau.]

crew: C. B. Oliver, G. E. Long, L. H. Rowe, R. W. Mayes, J. Walkinshaw, G. Watts, G. V. Bell, L. A. Moncrieff, R. W. Dick, J. E. Scott, S. T. Keeley, G. N. Potter, S. E. Scott, N. G. Mann, L. H. King, W. R. Gent, Z. Little, and J. E. Rarp.

The R.33, besides being moored to the mast, had additional ballast in the form of four heavy gun-carriage wheels. The mooring arm, on the mast, first broke, and then the nose of the airship crashed down on to the top of the mast, which smashed the framework of the bows and punctured the first gas compartment. Narrowly missing hangars, buildings, etc., on the aerodrome, the R.33 was then blown stern first out towards the coast—with, incidentally, the gun-carriage wheel still hanging suspended from the hull.

Within two minutes of the break-away Lieut. Booth had one of the engines going, and a few minutes later was in wireless communication with Pulham. In half an hour the R.33

men and women—lent a hand in safely housing the truant, battered but triumphant. This, briefly, is the story of R.33's escapade. In *The Times* for April 20 Lieut. Booth tells his own story as follows:—

"Believe me," he said, "apart from the wonderful triumph for airship progress, the trip was only an incident in the life of an airship crew. When we broke away from the mast on Thursday morning I was forward. We felt an unusual jolt, and the bow began to sink, while there was a distinct rise aft. Instinctively I rushed to the control car and to my gratification found that all the crew had immediately taken their posts. I heard Sergt. Hunt cry out that we had broken loose, though I felt and knew before he shouted that this was so. My first thoughts were to get up, for in the wind that was blowing at the time I knew it would be bare minutes before we reached the sheds. Before we were 100 yards from the mast the port engine was started and we released

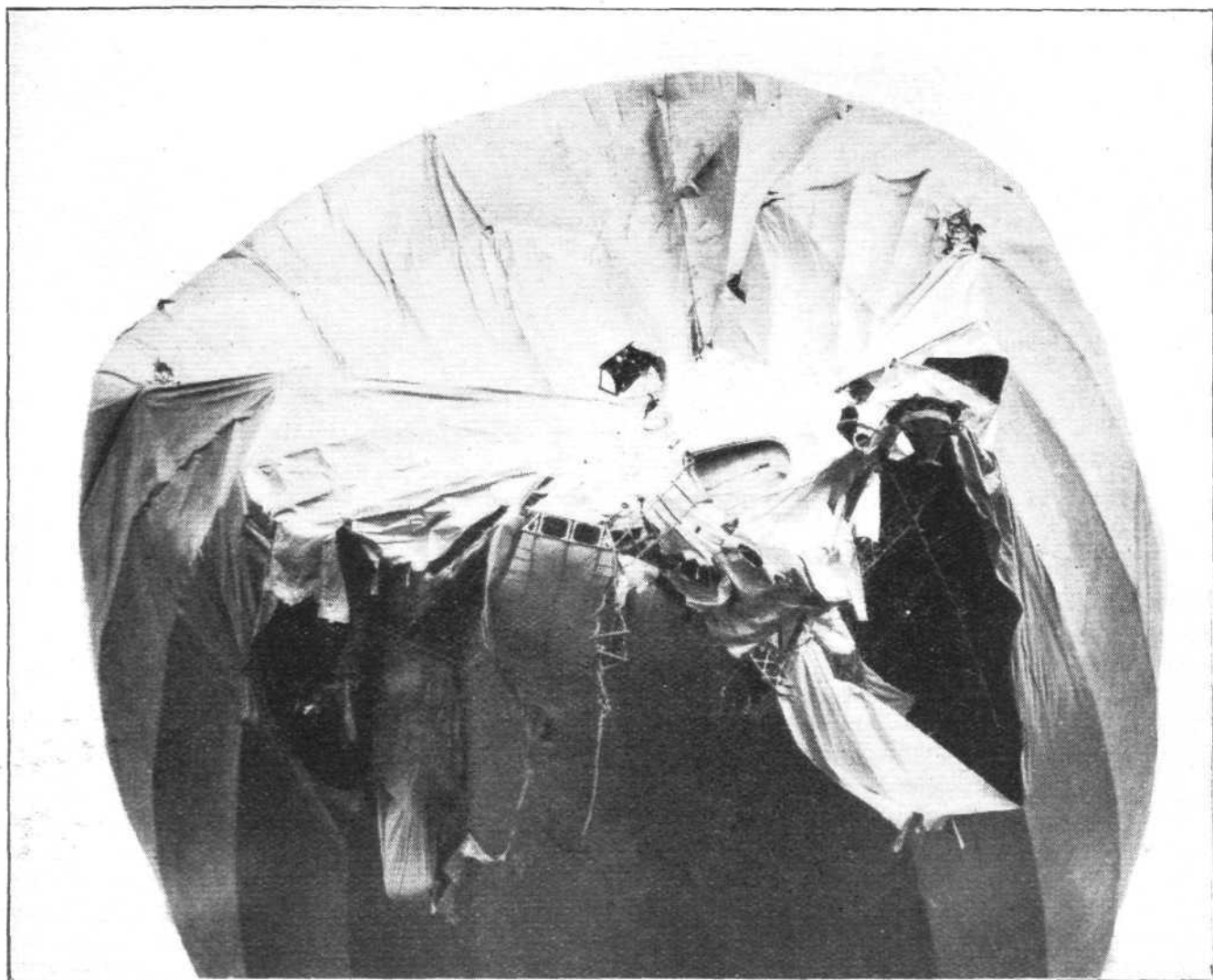


Photo: "Daily Mirror" Illustrations Bureau.

THE NOSE OF R.33: Among the wreckage may be seen the rope ladder which gave access to the airship, and the mooring cone which was torn off the mast.

was passing over Lowestoft, and as she passed out to sea she dropped a signal light, whereupon the Lowestoft motor-lifeboat *Agnes Cross* and the North Sea fisheries gunboat *Godetia* put out to sea with a view to rendering assistance if need be.

After leaving Lowestoft the R.33 was soon lost to sight in the clouds, only partly under control. During the day, however, she managed to keep in touch with Pulham by means of wireless. By 11 p.m., when off the Dutch coast, the reassuring message came through that she was well under control and, with the gale moderating, was making an attempt to return home. In the meanwhile preparations for an emergency landing had been arranged for at certain aerodromes in Holland—the Dutch Government very sportingly offering every assistance in this respect.

Then, in the early hours of April 17, the R.33 began her slow struggle homewards. She reappeared over Lowestoft about 1 p.m., and two hours later arrived back at Pulham, where several hundreds of willing enthusiastic volunteers—

about two tons of ballast. This carried us just above the gasometer, and, rising steadily, we passed over the 140 ft. aerial of the wireless station.

"We were drifting sternways, and after settling down to our jobs I gave Keeley, our wireless operator, a message for Pulham. By the way, I think particular mention of any member of the crew invidious, but Keeley really did splendidly. This message to Pulham asked for the weather report of the Humber district, and conveyed my intention of keeping to the north-east. We were on the coast at the time, and just after I investigated the damage to the bow more fully. This necessitated a trip on the roof of the ship. We made a bulkhead of the deflated No. 1 gas bag, and this prevented more damage by the gale. Just after 11 o'clock our position was 25 miles E.N.E. of Southwold, and at 12.20 we picked up news of the *Godetia*. She asked how we were getting on, and for our position. In reply we sent them word that our approximate position was 50 miles E.N.E. of Southwold, with a drift of 70 deg. at 15 to 20 knots, and we were flying

30 knots. We then had petrol for 24 hours. Periodically from this on we received valuable guidance from Maj. Scott at Pulham. His judgment showed splendid anticipation of the weather conditions. About half-past 1 we heard from Croydon that the authorities at Oslo, Copenhagen, The Hague, Brussels, Berlin, and Paris had been informed by the Foreign Office of our position, and requesting them to assist us if necessary to land. Shortly after we came into communication with Rotterdam, and they continued to give us our bearing for the rest of the trip.

"We were also in communication with the *Godetia*, and from time to time exchanged reports of conditions. At 4.15 we were about 25 miles W.N.W. from Texel. The ship was stationary and the wind was blowing N.W. at about 30 to 35 miles per hour. Pulham then suggested that we should head into the northerly wind until we could take the advantage of heading to westward; the wind was then falling considerably. A message from The Hague stated that the aerodrome De Kooy, 5 kilometres south of Den Helder, had 300 men ready if we needed them. However, there was no

"Throughout the whole of the time the ship behaved splendidly, and, apart from a few anxious moments, no one on board experienced the excitement of those who had to remain behind. We had plenty of food, hot drinks, and tinned fruit, so there was no hardship. It was hard luck on Irwin, our captain, at being left behind, for I know his heart was with his ship, and he would have given his all to be in her."

Further information on the "great adventure" is contained in the following copy of the log of R.33 during the 30 hours' ordeal:—

Thursday, 9.50.—Top of movable arm of mast head sheared and R.33 released from the mast carrying with her the top portion of movable arm.

9.52.—One engine running.

9.54.—Two engines running. Ship under control and kept head to wind at slow speed.

10.2.—Wireless contact established with Pulham. (Note.—From this point until the ship hauled in her aerial before landing wireless contact was maintained continuously.)

In the gondola:
Flight-Lieut.
Booth and mem-
bers of his crew
after the return
to Pulham.

Photo: "Daily
Mirror" Illustrations Bureau.



need to land, and a message that a landing party was ready at Pulham was more in keeping with our intentions. At 7.30 Rotterdam told us we could land at Waalhaven Aerodrome, and gave us the lights. The *Godetia* was still in touch with us, and we informed them at 8.30 that if the wind moderated we would return to England. We were then 10 miles south of Ymuiden. Soesterberne informed us that we could land there, but they were told of our intentions. Hereabouts the *Godetia* was joined by two Dutch destroyers. At 9.36 we reported crossing the coast 10 miles south of Ymuiden, and asked for the *Godetia* to show her searchlights, which she did. Five minutes after midnight we were remaining stationary, and as a precautionary measure made arrangements with the *Godetia* for a tow. We were 1,800 ft. up, and this would have meant dropping 1,500 ft., and, after inquiring about the ground wind, which was 15 knots, and reporting to Pulham, it was not necessary for us to adopt this measure. At 2.45 a.m. we began to make headway. Our progress was slow, but at 3.45 I reported to Pulham that we were making 15 knots for Lowestoft. From this on we continued an average advance of 6 or 7 knots on a course 0 N. 66 W. At 10 o'clock we were making 15 knots, and were 15 miles from Lowestoft at 12 o'clock. After bidding farewell to the *Godetia*, we crossed the coast at 1.10, and arrived at Pulham at 3 o'clock.

10.21.—Crossed coast at Lowestoft, still attempting to make westerly course, but being driven eastwards by gale.

11.—Received information from H.M.S. *Godetia* that she had left Lowestoft (10.47) to keep in touch with R.33.

11.05.—Twenty-five miles E.N.E. from Southwold, speed 20 knots.

11.40.—H.M.S. *Godetia* informed that R.33 had a crew of 20 on board.

11.47.—Position 22 miles E.N.E. Lowestoft. Speed increased to 30 knots, which was considered the maximum-safe air speed with the strained bow.

12.20.—R.33 instructed to make a northerly course if possible.

12.26.—Position 34 miles E.N.E. Lowestoft.

13.22.—In position 54 miles E.N.E. Lowestoft. R.33 reported—wind decreasing slightly.

14.05.—Position 66 miles N.E.E. of Lowestoft.

15.0.—Position 34 miles W.N.W. of Texel.

15.47.—Position 44 miles N.W. of Ymuiden.

16.05.—R.33 advised to head in northerly direction and attempt to make some northing until she could take advantage of it to make towards the westward. Wind at Pulham now moderating.

16.08.—R.33 in position 25 miles W.N.W. from Texel. Reported she was stationary. Wind 30 to 35 m.p.h.

16.50.—R.33 reported making five to ten knots sternway.
18.0.—R.33 reported wind still 40 to 45 m.p.h. north-westerly, otherwise everything O.K.

18.15.—Position 19 miles N.N.W. of Ymuiden.

18.33.—R.33 reported herself off Ymuiden; wind N.W., 40; ship making five knots, sternway, and that it was impossible to increase speed or to make westing till wind decreased. Engines O.K.

19.04.—R.33 reported herself over the shore near Ymuiden.

19.40.—Weather report sent to R.33, which was in a position south of Ymuiden.

21.25.—R.33 reported herself ten miles south of Ymuiden, and informed H.M.S. *Godetia*, which had kept in the vicinity of R.33, that she was returning to England if wind moderated.

20.44.—R.33 reported returning to England.

From 20.44 until 5 (Friday), R.33 made very slow progress. At 5 she was in a position 20 miles N.W. of Scheveningen.

7.—Ninety miles from Pulham.

9.—Fifty-nine miles E.S.E. of Lowestoft, and 75 miles from Pulham. Making a good 15 m.p.h.

9.45.—Forty-seven miles from Lowestoft.

10.53.—Forty-seven miles E. of Pulham. Making a good 12½ knots.

11.—Forty-four miles E. of Pulham. (Note.—On receipt of this message, landing party at Pulham were ordered to be at their stations at 1.30 p.m.)

12.—Twelve miles E. of Lowestoft, and 32 miles from Pulham.

13.—Had crossed the English coast at Covehithe.

13.54.—Ship sighted from Pulham airship station.

15.20.—Ship safely landed.

15.50.—Ship safely housed.

His Majesty the King sent the following message to air Vice-Marshal Sir Geoffrey Salmond:—

"Heartly congratulations to Flight-Lieut. Booth and his crew on their splendid achievement in skilfully handling R.33 in such exceptionally difficult and trying circumstances and bringing her back safely to Pulham. I am sure the Air Force will be proud of them as I am.—George R.I."

To which Sir Geoffrey sent the following reply:—

"Your Majesty's gracious message has been communicated to Flight-Lieut. Booth and crew of R.33. They are proud to have had the opportunity of putting to the test their faith in R.33 and thus earning your Majesty's approval. The Royal Air Force deeply appreciate your Majesty's generous tribute to Flight-Lieut. Booth and his crew."

THE ROYAL AIR FORCE

London Gazette, April 7, 1925

Medical Branch

D. B. Smith, M.B., is granted a short-service commn. as Flying Officer for three years on active list, with effect from, and with seniority of, March 19.

Reserve of Air Force Officers

The following are granted commissions in Class A, General Duties Branch, as Pilot Officers on probation (March 31):—R. A. Jacquot, A. J. Stubbings. The following are confirmed in rank:—Flying Officers S. J. Clinch, D.C.M. (March 30); W. Allan (April 7). Pilot Officers: C. G. Gass, M.C. (March 30); E. H. Rossington (March 30); F. G. Sinclair (April 7).

Flying Officer C. J. Clark is transferred from Class A to Class C (April 7); Flying Officer H. Forrest is transferred from Class B to Class C (April 7). The commn. of Pilot Officer on probation V. H. E. Baker is terminated on cessation of duty (Feb. 3) (substituted for *Gazette*, Feb. 3).

Memorandum

Flying Officer C. E. Noble relinquishes his hon. commission on ceasing to be employed under Directorate of Works and Buildings (Jan. 14).

ERRATUM.—*Gazette* of March 27 (*FLIGHT*, April 2, 1925, p. 205).—For M. Kortwright read M. Kortright.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain.—E. F. Briggs, D.S.O., O.B.E., to R.A.F. Depot, pending disposal on transfer to Home Estab. 22.3.25.

Wing Commanders.—G. P. Grenfell, D.S.O., to Air Ministry, for duty as "Attached Officer." 14.4.25. T. L. Leigh-Mallory, D.S.O., to R.A.F. Staff College, pending commencement of next Staff Course. 14.4.25.

Squadron Leaders.—L. F. Forbes, M.C., to No. 99 Sqn., Birmham Newton. 15.4.25. L. T. N. Gould, M.C., to R.A.F. Depot, on transfer to Home Estab. 19.3.25. L. G. S. Payne, M.C., A.F.C., to R.A.F. Depot. 14.4.25.

A. W. H. James, M.C., to R.A.F. Depot, on transfer to Home Estab. 28.3.25. R. J. Mounsey, O.B.E., to R.A.F. Depot, on transfer to Home Estab. 24.3.25.

Flight Lieutenants.—A. N. Bengt, to Air Ministry. 14.4.25. J. C. M. Hay, to Boys' Wing, Cranwell. 22.4.25. H. S. Broughall, M.C., D.F.C., to No. 207 Sqn., Eastchurch. 14.4.25. J. F. Stallard, to No. 2 Sqn., Manston. 8.4.25.

W. R. S. Humphreys, A.F.C., to Sch. of Photography, S. Farnborough. 31.3.25. T. W. Elmhirst, A.F.C., to Air Ministry. 15.5.25. W. E. Somervell, to No. 2 Sqn., Manston, on transfer to Home Estab. 19.3.25. A. C. Collier, to R.A.F. Depot. 15.5.25. L. Eardley-Wilmot, to No. 4 Flying Training Sch., Egypt. 24.2.25. W. E. Theak, to No. 13 Sqn., Andover. 17.4.25. F. H. Isaac, to Sch. of Photography, Farnborough. 16.4.25. E. S. Ades, to R.A.F. Depot. 23.4.25. A. J. Rankin, to Sch. of Naval Co-operation Lee-on-Solent. 1.5.25.

Flying Officers.—J. T. Hall, to R.A.F. Base, Leuchars; 6.4.25. F. A. Dinnage, to R.A.F. Base, Gosport; 15.4.25. E. R. Hockaday, to No. 1 Stores Depot, Kidbrooke; 21.4.25. J. W. Mitchell, to Air Ministry; 21.4.25. C. W. S. Chalmers, to No. 24 Sqn., Kenley; 20.4.25. W. R. K. Atkinson and G. E. Newton, to R.A.F. Depot on transfer to Home Estab.; 25.3.25. L. J. Booth, to No. 5 Flying Training Sch., Sealand; 14.4.25. A. E. Pitcher, M.M., to No. 1 Stores Depot, Kidbrooke; 1.2.25. C. H. Paget, to Aircraft Depot, India; 3.4.25.

Flying Officers.—H. J. Storey, to Station H.Q., Birmham Newton. 16.4.25.

L. S. Potter, to R.A.F. Depot, on appointment to a Short Service Commn. 7.4.25. L. S. Potter, to No. 58 Sqn., Worthy Down. 15.4.25. F. E. C. Benstead, to Station Commandant, Iraq. 19.3.25. F. W. Wrench and A. E. Platford, to R.A.F. Depot, on transfer to Home Estab. 19.3.25. C. E. Kelly and A. D. Page, M.M., to R.A.F. Depot, on transfer to Home Estab. 8.3.25. C. W. Cudemore, M.C., D.F.C., to R.A.F. Depot, on transfer to Home Estab. 8.3.25. D. Macfadyen, to No. 14 Sqn., Palestine. 19.3.25. R. V. D. White, to No. 16 Sqn., Old Sarum. 17.4.25. R. L. Ragg, to Experimental Section, R.A.E., S. Farnborough. 23.4.25. E. J. Rossiter, to R.A.F. Depot, on transfer to Home Estab. 24.3.25. F. V. Gauntlett, to Inland Area Aircraft Depot, Henlow. 22.4.25. R. P. Mollard, to No. 15 Sqn., Martlesham Heath. 23.4.25. C. H. Ratcliffe, to R.A.F. Depot, (Non-effective Pool) on transfer to Home Estab. 24.3.25.

Pilot Officers.—W. F. Langdon, to No. 14 Sqn., Palestine; 4.4.25. R. C. L. Lambert, to No. 11 Sqn., Netheravon; 28.3.25.

Pilot Officers.—F. S. O'Hanlon, to No. 39 Sqn., Spittlegate, on appointment to a Permanent Commn. from R.A.F. Cadet College. 12.3.25. M. E. de L. Hayes, to No. 207 Sqn., Eastchurch. 22.4.25.

Stores Branch

Squadron Leader.—H. T. Foxen, to R.A.F. Depot (non-effective Pool) on transfer to Home Estab. 8.3.25.

Flight Lieutenants.—E. M. Cashmore, to Station H.Q., Northolt. 26.5.25. E. E. Porter, M.B.E., D.C.M., to Station H.Q., Duxford. 27.4.25.

Flying Officers.—E. I. T. Duffield, to Air Ministry; 7.4.25. W. T. Lewis to Stores Depot, Iraq; 3.4.25.

Flying Officers.—R. G. Fussell, to Stores Depot, Egypt. 23.3.25. H. A. Lotherington, to R.A.F. Depot (Non-effective Pool) on transfer to Home Estab. 19.3.25.

Accountant Branch

Flying Officers.—J. M. Adams, to No. 6 Armoured Car Co., Iraq. 4.4.25. J. C. Christian, M.C., to R.A.F. Depot, on transfer to Home Estab. 8.3.25.

Royal Air Force Display

THE Royal Air Force Pageant, which was instituted in 1920 has now been re-named the Royal Air Force Display. This year's (the sixth) display will take place on Saturday, June 27, at the London Aerodrome, Hendon. His Majesty the King, Chief of the Royal Air Force, hopes to be able to attend. This annual review of the flying units is an integral and important part of the annual training of the Royal Air Force, and provides a valuable stimulus to keenness and efficiency in the many squadrons taking part in the inter-unit competitions and displays. A programme has been arranged which will fully equal that submitted in previous years, and new features are being introduced which will enable the public to appreciate the developments that are constantly taking place in the aerial arm. Full details of

the programme will be issued at a later date. As in the case of the Royal Tournament, all the proceeds are devoted to Service charities.

New Royal Air Force Title

THE Air Ministry announces that His Majesty has been graciously pleased to approve of the most senior rank in the Royal Air Force being changed from "Marshal of the Air" to "Marshal of the Royal Air Force."

Royal Air Force Flying Accident

THE Air Ministry regrets to announce that as a result of an accident near Shaibah, Iraq, to a D.H.9A of No. 84 Squadron, Shaibah, on April 17, Flying Officer Thomas Thomson was killed. Flight-Lieut. Cyril Jameson Turan, A.F.C., the pilot of the aircraft, being uninjured.

South African Air Mail

REFERRING to the particulars of the South African Air Mail Service, given on p. 200 of our issue of April 2, For the benefit of those who may remember some of South Africa's airmen during the War, a few names may be of interest. Major Meintjes has had a roving commission up to now, and has been flying from base to base organising. Capt. Hector Daniels is at the Capetown end. Capt. Meredith is at the Durban end. Capt. Hamman is at Port Elizabeth. The other pilots are Lieuts. Schoeman, Tasker, Burger, Joubert, Caspareutheus, Hiscock, Roos. All are South Africans, and all are first-rate pilots with plenty of hard-won experience. A fortnight with them revealed the high sense of duty and *esprit de corps* that the force possesses, while it is very unlikely whether any air force in the world has a greater regard and respect for its C.O. than South African pilots have for Sir Pierre van Ryneveld, the Director of Air Services.

An American Airship in Trouble, Too

ON the same day that the R.33 broke away one of the American airships smashed her steering gear and drifted away rudderless with a crew of seven on board, passing over Granite City, across the Mississippi, and eventually landing without mishap at Black Walnut.

"Joystick" Claims

A DECISION was given in Paris on April 20, in the claim for 20,000,000 fr. made by M. R. Esnault-Pelterie against a number of British aircraft manufacturers in respect to "joystick" royalties. The president of the court decided that the claim could not succeed. He held that the court was incompetent to give a judgment because it really concerned the British Government.

The F.A.I. and Czechoslovakia

AT the end of September next the International Aeronautical Federation will hold a Congress at Prague, when 27 States will be represented. Czechoslovakia, having always been very keen in matters aeronautical, is displaying considerable interest and assistance in the matter, and the Ministries of National Defence and Public Works have granted large sums for the Congress, while a special committee composed of representatives of the Ministries of Foreign Affairs, National Defence, Public Works and the Aero Club has been elected to make preparations. The programme will include several banquets given to the delegates by the Czechoslovak Aero Club, the Federation of Pilots, Aircraft Constructors, etc., while other events will consist of a gala performance at the National Theatre, a flying meeting, and visits to the Czechoslovak aircraft works.

Gordon Shephard Memorial Prize

THE Gordon Shephard Memorial Prizes, which are given annually for the best essays submitted by members of the Royal Air Force on subjects selected by the Air Council, have been awarded as follows in the 1924 competition:—

First Essay.—First prize, Flying Officer E. J. Kingston McCloughry, D.S.O., D.F.C.; second prize, Flight-Lieut. A. S. G. Lee, M.C.

Second Essay.—First prize, Squadron-Leader J. L. Vachell, M.C.; second prize, Wing-Comdr. E. D. M. Robertson, D.F.C.; third prize, Squadron-Leader L. L. MacLean.

The competition was established as a memorial to the late Brig.-Gen. G. S. Shephard, D.S.O., M.C., Royal Air Force.

Royal Aeronautical Society

WILL readers please note that the thirteenth Wilbur Wright Lecture will be held in the Library of the Royal Aeronautical Society, 7, Albemarle Street, London, W. 1, at 8.30 p.m. on April 30, when Rear-Admiral D. W. Taylor, U.S.N., will lecture on "Some Aspects of the Comparison of Model and Full-Scale Tests."

Wrigley-Ford Aero Planes?

ONCE again, it would seem, chewing gum is to play an important part in aviation, for it is reported that Philip Wrigley—whose name is well known to those who are in the habit of attempting to solve the problem of perpetual motion—has joined forces with Mr. Henry Ford, Mr. Edsel Ford and Detroit and New York bankers in organising American Airways, Ltd.

The Aeroplane and the Bank

It is reported that just recently a bank failed at Bogota, Columbia, with the result that a serious run was threatened upon all the other banks. In order to meet the situation the Government of the Republic of Columbia declared all business suspended for three days, and sent seaplanes to Barranquilla (on the coast) for banknotes and securities, the journey there and back taking 48 hours, as against 14 days by boat. When the banks in Bogota reopened, they were ready to meet all demands.

IMPORTS AND EXPORTS, 1924-1925

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910). For 1910 and 1911 figures see "FLIGHT" for January 25, 1912; for 1912 and 1913, see "FLIGHT" for January 17, 1914; for 1914, see "FLIGHT" for January 15, 1915; for 1915, see "FLIGHT" for January 13, 1916; for 1916, see "FLIGHT" for January 11, 1917; for 1917, see "FLIGHT" for January 24, 1918; for 1918, see "FLIGHT" for January 16, 1919; for 1919, see "FLIGHT" for January 22, 1920; for 1920, see "FLIGHT" for January 13, 1921; for 1921, see "FLIGHT" for January 19, 1922; for 1922 see "FLIGHT" for January 18, 1923; for 1923, see "FLIGHT" for January 17, 1924; and for 1924, see "FLIGHT" for January 22, 1925.

	Imports.		Exports.		Re-Exports.	
	1924.	1925.	1924.	1925.	1924.	1925.
Jan. . .	2,213	3,546	52,239	83,728	2,219	291
Feb. . .	920	985	26,349	85,639	335	20
Mar. . .	11,381	—	34,113	56,881	509	9,355
	14,514	4,531	112,701	226,248	3,063	9,666

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PUBLICATIONS RECEIVED

Department of Overseas Trade. Report on the Economic and Financial Conditions in Belgium, December, 1924. By J. Picton Bagge. H.M. Stationery Office, Kingsway, London, W.C. Price 3s. 6d. net.

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SIDE-WINDS

As will have been gathered elsewhere in this issue, wireless played quite a big part in the involuntary flight by R. 33 over the North Sea, and it may be of interest to note in this connection that the famous "Exide" batteries, supplied by the Chloride Electrical Storage Co., Ltd., of Manchester, formed a part of the R. 33's equipment.

THE Royal Air Force not only—and rightly too—prides itself upon being smart and up-to-date in the matter of machines and its skilful pilots, but upon the general appearance of its officers' and men's uniforms. Burch's at 401, Strand, W.C. 2, have for some time past made a profound study of R.A.F. officers' uniforms, and have brought the whole issue from the point of fit and price to a fine art. Any officer requiring an outfit would materially profit by consulting Mr. H. M. Dain, the proprietor, who spares neither time nor trouble to give utmost satisfaction to the minutest detail.

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AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

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Published April 23, 1925

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